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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

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Vol. 17 January 15, 1925 No. 1
Personnel (Jan.1-15) and Field Station (Dec. 16-31) Issue

PERSONNEL ITEMS

Donald G. Fletcher, assistant pathologist in barberry eradication with headquarters at the Conference for the Prevention of Grain Rust in Minneapolis, Minn., who spent nearly three weeks in the Office assembling and preparing statistical data and reports of the barberry eradication campaign of the past year, left Washington January 7 for Minneapolis.

Dr. E. F. Gaines, cerealist at the State College of Agriculture, Pullman, Wash., and agent in the cereal experiments conducted in cooperation with this Office, who has been in Washington since November left January 7 to return to Pullman, Wash.

H. H. McKinney, associate pathologist in the cereal-disease investigations conducted in cooperation with the Wisconsin Agricultural Experiment Station, came to Washington December 29 to confer with officials of the Office concerning future experiments and to make final revision of five pending manuscripts. He also attended the meetings of the American Phytopathological Society. Mr. McKinney returned to Madison, Wis., January 2.

H. S. Smith, assistant administrative officer, left Washington January 10 to attend the conference of State leaders of barberry eradication at Minneapolis and St. Paul, Minn., from January 12 to 16.

VISITORS

Dr. William H. Weston, of Cambridge, Mass., formerly pathologist in charge of the investigation of downy milders of cereals, was an Office visitor January 2.

MANUSCRIPTS AND PUBLICATIONS

A manuscript, entitled "The Rosette Disease of Wheat and Its Control," by H. H. McKinney, R. W. Webb and G. H. Dungan, was submitted January 5 for publication as a cooperative bulletin by the Illinois Agricultural Experiment Station.

A paper, entitled "Corn Judging and the Productiveness of Corn," by F. D. Richey, was approved January 8 for publication in the Journal of the American Society of Agronomy.

A manuscript, entitled "Physiologic Evidence on the Genetic Identity of Natural and Synthetic Strains of Wild Emmer," by Olaf S. Aamodt and Moses N. Levine, was submitted January 9 for publication in the Journal of Agricultural Research.

A paper, entitled "The Relation of Plant Physiology and Chemistry to the Study of Disease Resistance in Plants," by J. G. Dickson, was approved January 9 for publication in the Journal of the American Society of Agronomy.

Galley proof of article, entitled "Some Cases of Apparent Single Fertilization in Barley," by H. V. Harlan and M. N. Pope, for publication in the American Journal of Botany, was read January 2.

Page proof of Department Bulletin 1276, entitled "Varietal Experiments with Hard Red Winter Wheats in the Dry Areas of the Western United States," by J. Allen Clark and John H. Martin, was read January 8.

Page proof of Department Bulletin 1309, entitled "Experiments with Small Grains on the Arlington Experiment Farm," by John W. Taylor, was read January 8.

Second page proof of Department Bulletin 1275, entitled "Varietal Susceptibility of Oats to Loose and Covered Smuts," by George M. Reed, Marion A. Griffiths and Fred N. Briggs, was read January 2.

The paper, entitled "Heritable characters of Maize. XX.-Iojap Striping, a Chlorophyll Defect," by Merle T. Jenkins, appears in the Journal of Heredity v. 15, no. 11, p. 467-472, fig. 20-21. November, 1924. Literature cited, p. 472. ("This investigation was conducted jointly by the Office of Cereal Investigations, Bureau of Plant Industry, and the Farm Crops Section, Iowa Agricultural Experiment Station.") (Received January 7, 1925)

The article, entitled "The Effect of Rotation and Tillage on Foot-Rot of Wheat in Kansas, 1920-1924," by M. C. Sewall and L. E. Melchers, appears in the Journal of the American Society of Agronomy, v. 16, no. 12, p. 768-771, 3 fig. December, 1924. Literature cited, p. 771. (Cooperation between Office of Cereal Investigations and the Kansas Agricultural Experiment Station.) (Received January 7, 1925)

Department Circular 332, entitled "Chemical Eradication of the Common Barberry," by Noel F. Thompson, was received from the Government Printing Office January 12.

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FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (No report)

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (H. H. Love) (No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (No report)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (No report)

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (No report)

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (December 16) At 4 P. M. this afternoon the temperature was 8° F. and still falling. This is our first real cold snap for the season.

A timely rainfall of 0.69 of an inch on December 3 and 4 was of great value in reviving the winter wheat which had begun to suffer from the drought. The rain moistened the ground in the well-prepared seed beds to a depth of about 6 inches. There is very little sub-moisture.

The annual report for 1924 is now being prepared.

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins. (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (No report)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) (No report)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (No report)

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (January 2) The temperatures of the first half of December were generally mild. Maximum temperature for this period was 56° December 12; minimum -20° December 15. Previous to December 15, the only below zero temperature was -1° November 12 and December 8. After December 15 below zero temperatures were recorded every day for the remainder of the month. For the five consecutive days December 16 to 20 the temperature did not rise above zero even during the day. The maximum temperature for the last half of the month was 28°, December 25; minimum, -31° December 26 and 27.

The ground is covered with a light blanket of snow. The total precipitation for December was 0.28 of an inch; total precipitation for the calendar year 1924, 16.25 inches.

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (January 2) The weather of the first half of December was very dry and windy while that of the last half was very cold and more or less snowy. The minimum temperatures recorded in December were -40°, -32°, and -30° on December 18, 17, and 16, respectively. During the seven-day period from December 16 to 22 inclusive, the temperature remained below zero continuously except for a short period on December 20 and 21.

The maximum recorded was 61° on December 13, 14, and 15. During the afternoon and night of December 14 the temperature dropped from 61° to -19°, a total of 80 degrees in about 18 hours.

The total precipitation recorded in December was 0.41 of an inch, as compared to 0.74 of an inch as the average of 26 years. The precipitation recorded in November was only 0.08 of an inch, and in October only 0.51 of an inch. In each month since June it was below average.

The dry windy weather in the first half of December injured fall-sown wheat considerably. However, it is too early to estimate the extent of the injury. The fields are now covered with snow.

I hope to complete my report to the Office of Cereal Investigations by January 15 or 20.

The wife of Director F. B. Linfield of the Montana Agricultural Experiment Station, died of pneumonia on the evening of December 31, 1924.

State College of Agriculture, Bozeman (Barberry Eradication, W. N. Christopher) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (No report)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (January 5) Mild weather prevailed in eastern Oregon during the first two weeks in December. Maximum temperatures as high as 59 degrees were recorded at Moro, and the minimum temperatures during most of the period were above freezing. Winter wheat grew rapidly, all dates of sowing completely emerging.

On the 16th the temperature suddenly dropped to below zero. The minimum on the 15th was 31° and on the 16th one degree below zero. On the 17th, 18th, and 19th the minimum temperatures were also below zero with no snow on the ground. About four inches of snow fell on the 20th and the temperatures continued below zero. There were twelve days during this cold period with temperatures of zero or below, the coldest being 11 below on the 25th. The weather began to moderate on December 28 and from that time to date it has been warmer than normal, with practically no precipitation. The total precipitation for the calendar year 1924 was 8.18 inches.

Examination of the winter wheat at the Station shows that severe winter-killing has occurred. While too early to determine definitely the extent of injury, it now appears likely that much of the winter-wheat area will have to be reseeded to spring grain. The varieties which have made most growth seem to be injured most. All winter wheat is only in the one leaf stage.

The injury to winter wheat seems to be general throughout eastern Oregon. Conflicting reports are received from farmers, some claiming little injury to wheat and others claiming that their wheat is completely winterkilled.

Much of the wheat which now seems to be severely injured may recover with favorable weather, so that reseeding may not be necessary; but at the present time this does not seem likely.

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell) (No report)

Agricultural Experiment Station, Berkeley (F. N. Briggs) (No report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 January 31, 1925 No. 2
Personnel (Jan. 16-31) and Project Issue

PERSONNEL ITEMS

Dr. C. R. Ball, senior agronomist in charge of cereal investigations, will present two lectures on the subject of Cooperation in Research before the class in the Organization and Method of Research in the Department Graduate School. The first lecture, entitled "Personnel and Personalities," will be delivered on February 4, and the second, entitled "The Method and Value of Cooperation," will be presented February 9.

Miss Dorothy E. Bossert was appointed January 26 as clerical assistant to the State leader of barberry eradication in South Dakota, with headquarters at Brookings. Miss Bossert succeeds to the position formerly held by Miss Emma Fairchild, who was transferred January 4 to the office for the Enforcement of the Grain Futures Act in Chicago.

Dr. A. M. Brunson, associate agronomist in charge of cooperative corn experiments at the Kansas Agricultural Experiment Station at Manhattan, who has been in Washington since last November, left on January 22 to return to his headquarters.

Dr. G. M. Hoffer, pathologist in charge of the investigation of root, stalk, and ear rots of corn, in cooperation with the Purdue University Agricultural Experiment Station, has been authorized to attend the meetings of the National Canners' Association at Cincinnati, Ohio, January 28 to 30, and to present there a paper, entitled "Producing Sweet Corn Varieties." Doctor Hoffer also will attend the sessions of the Association of Southern Agricultural Workers at Atlanta, Ga., February 3 and 4 to present a paper on the present status of investigations of root, stalk, and ear rots of corn.

C. W. Hungerford, plant pathologist at the University of Idaho, and agent in the stripe-rust investigations conducted in cooperation with this Office, who has been in Washington since December, left on January 20 for his headquarters at Moscow, Idaho.

Dr. F. E. Kempton, associate pathologist in charge of barberry eradication, returned January 24 from Minnesota where he attended the Fourth Annual Session of the Conference for the Prevention of Grain Rust and the annual meetings of the leaders and collaborators in barberry eradication and rust epidemic studies. A short résumé of the program of these meetings will be found in another column of this number of the Courier.

C. H. Kyle, agronomist in corn investigations, has been authorized to attend the meetings of the Association of Southern Agricultural Workers at Atlanta, Ga., February 3 and 4, and to confer with agricultural workers at the Tennessee Agricultural Experiment Station, Knoxville, Tenn. Mr. Kyle will be away about 10 days.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, addressed the Virginia Dairy and Crop Improvement Convention at Roanoke, Va., on the subject of Plant Breeding on January 23.

Dr. E. B. Mains, agent in the cooperative cereal-disease investigations conducted at Purdue University Agricultural Experiment Station, who came to Washington in December, left January 17 to return to La Fayette.

L. S. Mayer, assistant agronomist in corn investigations, with headquarters at Knoxville, Tenn., where cooperative corn experiments are being conducted with the Tennessee Agricultural Experiment Station, has been authorized to attend the meetings of the Association of Southern Agricultural Workers to be held at Atlanta, Ga., February 3 and 4.

The appointment of Emil H. Ostrom, formerly field assistant and more recently agent in the barberry eradication in Minnesota, was terminated on January 21, the activities of barberry eradication campaign having been reduced for the winter. Mr. Ostrom has resumed his studies at the University of Minnesota.

VISITORS

Dr. L. R. Jones, professor of plant pathology of the University of Wisconsin, was an office visitor January 20.

Miss Louise M. Venable, formerly assistant in the flax investigations of this office, and now in the extension service of the University of North Carolina, renewed acquaintances in the office in January.

MANUSCRIPTS AND PUBLICATIONS

5* A manuscript, entitled "Improved Oat Varieties for the Corn Belt," by L. C. Burnett, T. R. Stanton, and C. W. Warburton, was submitted January 24 for publication as a Department Bulletin.

6 A manuscript, entitled "Studies on Ophiobolus graminis Sacc. and the Take-All Disease of Wheat," by Ray J. Davis, was submitted January 24 for publication in the Journal of Agricultural Research.

7 Three manuscripts, entitled, respectively, "Experiments with Wheat on Dry Land in Colorado," "Experiments with Oats on Dry Land in Colorado," and "Experiments with Barley on Dry Land in Colorado," by F. A. Coffman, formerly in charge of cereal experiments at the Akron (Colo.) Field Station, were approved January 27 for incorporation in cooperative bulletins of the Colorado Agricultural Experiment Station.

8 A manuscript, entitled "Outlook and Recommendations for the 1925 Seed-Flax Crop," by A. C. Dillman, A. C. Arny, Clyde McKee, T. E. Stoa, and A. N. Hume, was submitted January 27 for publication as a Department Circular in cooperation with the Minnesota, Montana, North Dakota, and South Dakota agricultural experiment stations.

9 A manuscript, entitled "Problems and Progress in Barberry Eradication," by C. R. Ball, was approved January 31 for publication in the Proceedings of the 4th Annual Meeting of the Conference for the Prevention of Grain Rust. This is a revised edition of the stenographic report of Doctor Ball's talk at the meeting.

Galley proof of paper, entitled "Certain Aspects of the Virus Diseases," by H. H. McKinney, for publication in Phytopathology, was read January 20.

Galley proof of Department Bulletin 1321, entitled "A Statistical Study of the Relation between Seed Ear Characters and Productiveness in Corn," by Frederick D. Richey and J. G. Willier, was read January 22.

Department Bulletin 1299, entitled "Relative Resistance of Wheat to Bunt in the Pacific Coast States," by W. H. Tisdale, John H. Martin, Fred M. Briggs, W. W. Mackie, H. M. Woolman, D. E. Stephens, E. F. Gaines, and F. J. Stevenson, was received January 20 from the Government Printing Office. (In cooperation with the California, Oregon, and Washington agricultural experiment stations.)

The paper, entitled "Segregation and Correlated Inheritance in Crosses between Kota and Hard Federation Wheats for Rust and Drought Resistance," by J. Allen Clark, appears in the Journal of Agricultural Research, v. 29, no. 1, p. 1-47, 3 pl., 9 fig. July 1, 1924. Literature cited, p. 46-47. (Received from the Government Printing Office January 31, 1925.)

* Manuscripts submitted during 1925 are numbered in the order of their transmission.

Résumé of Activities of Meetings of Barberry Eradicators, January 12-16, 1925,

by Dr. F. E. Kempton, Associate Pathologist in Charge of Barberry Eradication.

The fourth annual session of the Conference for the Prevention of Grain Rust and the annual meeting of the leaders and collaborators in barberry eradication and rust epidemiology studies were held in the plant pathology building, University Farm, St. Paul, Minn., January 12 to 16, inclusive. The session of the Conference took up all of the first day, while the meetings of the leaders and cooperators extended through the remaining four days.

At these meetings was renewed the war cry of 1918, when the United States Department of Agriculture and the 13 small-grain-growing States of the upper Mississippi Valley began the eradication of the common barberry as a means of reducing stem-rust losses of wheat and other small grains. At the meeting of the Conference for the Prevention of Grain Rust Dr. C. R. Ball, senior agronomist in charge of the Office of Cereal Investigations, presented the problems, progress and results of six and one-half years of barberry eradication and plans for the future. He also gave an excellent radio talk on the common barberry and black stem rust from the Washburn-Crosby broadcasting studio (WCCO station) in Minneapolis at 6:30 p.m., January 12.

N. J. Holmberg, Commissioner of Agriculture of Minnesota, was chairman of the meeting of the Conference for the Prevention of Grain Rust, which was addressed by former Governor Lowden of Illinois. Dr. E. C. Stakman, gave a characteristic address even more effectively than at former meetings. Former Governor J. A. O. Preus and Governor Christenson of Minnesota were in attendance. The latter was elected president of the Conference for next year.

Plant pathologists and other representatives of the agricultural colleges, governors and former governors, commissioners and secretaries of agriculture, State entomologists, members of horticultural boards, presidents and secretaries of farm organizations, members of grain storage and milling interests would not have come great distances to take part in these meetings if they had not been convinced that the eradication of the common barberry as a means of controlling stem rust of small grains is a worth while enterprise bringing results in financial gain to American agriculture.

One outstanding fact presented was that in most States of this group during 1924 barberries were in most every case found closely connected with local epidemics of stem rust. This was true whether the rust was on oats, wheat, rye, barley, or grasses that are severely attacked by this rust. It was shown at this meeting that much had been accomplished. It was also especially brought out that although the work has gone far it is not yet complete. While over ten million and a half bushes, sprouting bushes and seedlings have been eradicated from 786 counties, yet in a second combing of over 100 counties the first survey was shown to be only 92 per cent effective. It also was brought out that one barberry bush overlooked may be the source of widespread epidemics locally.

The sessions of the meeting of leaders and cooperators were taken up largely with discussion of better methods of survey, methods of checking for efficiency of survey, the effectiveness of chemical methods of eradication, more careful mapping of areas of escapes in order that all seedlings may be found during the many resurveys that these areas must have before they are cleaned up, and other details of operation. As a whole this series of meetings was one of the most successful that has been held during the eradication campaign.

PROJECT REPORTS

CEREAL-DISEASE INVESTIGATIONS

(Dr. H. B. Humphrey, Senior Pathologist in Charge)

RUST INVESTIGATIONS

REPORT OF PROGRESS IN BARBERRY ERADICATION TO DECEMBER 31, 1924

By Dr. F. E. Kempton, Associate Pathologist in Charge, and
L. D. Hutton, Associate Pathologist.

INTRODUCTION

The barberry eradication campaign, as a means of controlling stem-rust epidemics, was started by the Office of Cereal Investigations, Bureau of Plant Industry, U. S. Department of Agriculture, in 1918. It is conducted in cooperation with the following north-central, grain-growing States: Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin and Wyoming. By removing the barberries from this area it is hoped to eliminate entirely the small local epidemics which are directly traceable to common barberries, and to remove the many sources of inoculum of the large epidemics which frequently cause immense small-grain losses.

Similar barberry eradication campaigns have been carried on by many European countries in the last two hundred years. The most notable of these is the campaign begun in 1903 in Denmark where stem rust had previously done serious damage. Practically no stem-rust attacks have occufred in that country since the removal of the offending barberries. Eradication campaigns in other countries have not been entirely successful because careful surveys were not made and the laws were not rigidly enforced, but in many local areas beneficial results have followed immediately upon the removal of the common barberries.

ORGANIZATION

Some preliminary publicity and organization of the campaign was done in the spring of 1918, with a portion of the special appropriation for "Stimulating Agriculture." The first direct Federal appropriation, $150,000, became available July 1, 1918. A State leader was appointed to take charge of the work in each of the 13 States. The State leader's duties are to supervise the work in the State, following the general plans outlined by the Office of Cereal Investigations. He must make contacts with State officials who cooperate in the work, direct the various phases of the campaign within the State, hire field assistants, arrange for transportation of men and chemicals, plan and supervise the surveys, and compile reports of the work. Annual appropriations averaging $254,387.85 and totaling $1,780,715 have been made. State cooperation in cash and services equivalent to a total of about $464,000 has helped to make the work more effective.

PUBLICITY AND EDUCATION

Publicity has been carried on in each State under the direction of the State leader or a specially trained assistant, in cooperation with the Conference for the Prevention of Grain Rust. Besides an attempt to spread barberry eradication publicity generally throughout each State, efforts have been made to thoroughly familiarize every citizen of each county with the purpose of this campaign just previous to the original survey in that county. After the survey in a county is completed the public has been informed of the results.

Publicity through schools has been especially emphasized during 1924. The cooperation of Smith-Hughes instructors and city and county superintendents of schools has made it possible to train many of the school children to identify the common barberry and the stages of stem rust. Sixteen sets of a lantern-slide series, "Kill the Common Barberry," and a number of prints of the motion picture films "The Barbarous Barberry" and "The Battle Against Black Stem Rust" have been circulated so that people could learn to know the characteristics of the common barberry and see the damage that it does by spreading stem rust to small-grain crops. Demonstrations and portable window displays have been used in all of the States to emphasize the necessity of removing barberries. Circular letters have been sent to at least half of the rural property owners in many of the States. Numerous newspaper articles have been published in each State. These show the purpose and summarized results of barberry eradication and tell especially of the removal of large bushes and hedges which have been shown to have caused serious local stem-rust losses.

The Conference for the Prevention of Grain Rust, composed of representatives of agricultural and allied interests, has cooperated in every way to make the publicity campaign more effective. Over one million copies of the circular "Farmer Brown Beats the Rust" were distributed to the farmers of the small-grain growing States. Special statements to business men, charts ofor use in schools and window displays have been effectively distributed. During the past year the Conference has distributed thousands of samples of common barberry twigs for use in identifying the bush. The United States Department of Agriculture and the Conference for the Prevention of Grain Rust have distributed a total of approximately five million bulletins and circulars relating to the barberry eradication campaign.

State circulars and bulletins have received a very wide distribution within each of the States. The State leaders also have published reports and articles in cooperation with the State Experiment Stations, Extension Services, and allied Agricultural College departments.

SURVEYS

Original Survey

The original survey is the first complete survey of every city and village property and farm in a county. The thirteen States in the eradication area contain 976 counties. Original survey appears to be necessary in an area equivalent to about 895 counties. The original survey in cities and villages was largely completed in the first two years of the campaign. Rural survey was begun in 1919. In cities, survey was done on foot. Rural farm-to-farm survey made it necessary to procure other means of transportation so that every farm might be visited and the barberries economically found and eradicated. In order that tools and chemicals for eradication might be transported also, fifty-two light trucks were purchased. for use where there was a long seasonal period of survey. Additional cars were rented during the summer months when weather conditions and available trained field men made it possible economically to increase the field force. Rented automobiles also have been used in areas where the surveys are nearly completed.

Since April, 1918, practically all city and village properties and all rural properties in 786 counties have been covered by the original survey. The first survey has been completed in Indiana, Iowa, North Dakota, South Dakota, Wisconsin and Wyoming, and practically completed in Colorado, Minnesota and Nebraska. There still remain 59 counties to be surveyed in Illinois, 22 or more in Michigan, 20 in Ohio and 10 or more in Montana. To December 31, 1924, a total of 6,358,343 barberry bushes has been found on 68,465 properties. Of these, 63,026 properties have been entirely cleared of 5,458,159 bushes. During the year 1924, 295,814 bushes were found and 388,632 were destroyed.

Second Survey

Local stem-rust epidemics of 1922 and 1923 in counties which had been covered by an original survey, made it apparent that some barberries had been missed in some of the counties previously surveyed. Especially did the necessity of a second survey become apparent during 1923 when many local stem-rust epidemics were traced directly to the offending barberry bushes. With information gained in previous surveys, the methods of farm-to-farm survey during 1923 and 1924 have been made more efficient to prevent, as far as possible, any bushes being missed. On second survey it is hoped to get every bush previously missed. One of the problems of second survey has been the escaped bushes and seedlings not found on the original survey. The problem of seedlings must be contended with continually on second survey and resurveys. Revisits must be made to all properties where escaped bushes and fruiting bushes have been found. Areas of escaped bushes or areas in which it is probable that birds, other animals, or streams have spread the seeds must be gone over carefully so that all new seedlings and missed bushes are eradicated. If maps of these areas have been made they must be checked to make sure the outer boundaries of the areas are included. If no maps have been made this must be done. By this means the expense of subsequent resurveys is reduced to a minimum and little or no stem-rust inoculum is allowed to spread from these barberries to the small-grain crop. On the basis of bushes found on the second survey so far accomplished the original survey was about 92 per cent efficient. Many of the bushes found on second survey are bushes that were cut down but not killed by property owners in the beginning of the campaign. The locations of these cut bushes were not reported and the field men often were unable to find them. Sprouts appeared later and the bush again spread stem-rust inoculum.

In the equivalent of 60 counties, 4,841 bushes were found on 695 properties in second survey in 1924, and 5,023 bushes were destroyed on 699 properties. In addition, 8,703 seedlings were found and destroyed on 46 of these properties.

From the beginning of the second survey in 1922, to December 31, 1924, an area equivalent to over 111 counties has been covered by second survey. A total of 10,106 bushes was found on 1,003 properties. Of these, 10,086 bushes have been destroyed. All of the 9,579 seedlings found on 54 of these properties were destroyed.

The data on properties, bushes and seedlings for the second survey are included in the tables of data for the original survey as the bushes and seedlings found in new locations on second survey are new. Sprouting bushes and seedlings found in old locations are given under resurvey.

Barberry bushes usually sprout the year following digging and within two years after chemical treatment, where the chemicals have not destroyed all stems. This necessitates a revisit to every property upon which barberries have been previously found. Resurveys do not follow the original survey for at least two growing seasons, thus allowing time for any living roots to sprout and for scattered seeds to germinate. In many instances several resurveys are necessary. During the second surveys of 1923 and 1924 it was necessary to resurvey a large number of properties on which barberries had been previously located in many of the counties. Combining these two activities in this way in those counties, practically eliminates the expense of one resurvey. As a rule, resurvey will be combined with the second survey in those counties where a second survey is necessary.

From January 1 to December 31, 1924, a total of 21,852 sprouting bushes were found on 1,960 properties in the equivalent of 203 counties in which resurvey activities were carried on. Of these sprouting bushes 6,616 were dug and 15,234 were treated with chemicals, making a total of 21,850 sprouting bushes destroyed during the year. Many new seedlings were found on properties from which the fruiting bushes had been removed three or more years previously. A total of 136,612 seedlings was found and destroyed on 564 properties.

In the entire campaign, 273,619 sprouting bushes on 10,925 properties and 2,185,216 seedlings on 3,394 properties have been found. Of these, 272,593 sprouting bushes and 2,135,216 seedlings have been destroyed.

ERADICATION

Until the fall of 1922, barberry bushes were either dug or pulled with horses and tractors, and seedlings were pulled by hand or dug. Numerous sprouts developing indicated that pulling and digging were not effective methods of eradication in a majority of instances. Although digging is very effective in a loose sandy soil, it is almost impossible to remove barberries which are growing in rocky soil, near tree roots, or in rock crevices, without leaving some roots. As even small portions of roots may sprout, every remaining root fragment is a potential rust producer.

To increase the efficiency of eradication, experiments with chemicals were begun in the fall of 1921. Of over forty chemicals used experimentally, only crushed rock salt and kerosene are recommended since they are effective, cheap, and easy to obtain and apply. Sodium arsenite was used for several months during 1923 but its use was discontinued because of the danger to livestock. Kerosene is very effective. The disadvantages of its use are that it is hard to tell which ones of a group of bushes have been treated and that the treated bushes do not die immediately following treatment. It is not advisable to use kerosene when the bushes should be killed immediately as infected bushes can spread inoculum for a time after kerosene treatments. During 1924, 13,358 gallons of kerosene were used in barberry eradication. Practically all of this quantity was used in Ohio, Michigan and Nebraska. Barberry bushes die about two weeks after the application of salt. Salt is easily applied and can be conveniently transported in the Government-owned trucks. There is very little danger to livestock in the use of salt if the animals are not allowed to eat too freely of it. Poultry are very likely to be killed by eating salt. To prevent this it is advisable to cover the base of all treated bushes with dirt.

Ecological Investigations

The relation of environment to the distribution of barberry bushes has been studied in the 13 States of the barberry eradication area, and in the New England States, New York, New Jersey and Pennsylvania. Particular attention has been given to areas of escaped barberries throughout these States. Colorimetric analyses of soils were made and data compiled on the several floristic and ecologic factors which characterize certain areas of escaped barberry bushes. The size and vigor of the bushes in the States bordering the Great Lakes and in northeastern Iowa indicates that the common barberry has reached its greatest development in those areas. The two chief factors limiting growth seem to be soil reaction and moisture. In the Great Plains portion of the eradication area the bushes do not attain the height of those in the Great Lakes region, as the climate is too dry. Observations indicate that while barberries are tolerant to acid soil conditions, escaped and native barberries are usually distributed only on limestone or neutral soils. A manuscript in preparation will summarize the results.

Study of Barberry Species and Hybrids

A Berberis garden has been established near Bell, Maryland, in cooperation with the Office of Horticultural Investigations, wherein all known foreign and native species and hybrids of Berberis are being assembled for description and classification. A sufficient number are being propagated so that the susceptibility of all of these species and hybrids can be determined at St. Paul, Minnesota, under controlled conditions. The literature has been searched, herbarium material examined, field observations made and greenhouse specimens studied for evidence of the susceptibility of various species. Some of this data has been summarized by E. C. Stakman and M. N. Levine, in "A Partial Report of the Susceptibility and Resistance of Berberis and Related Genera to Stem Rust." Cereal Courier 15: 278-287, September 30, 1923. L. W. Melander has added to this information in connection with the preparation of a master's thesis, "Studies of the relation of Berberis species to Puccinia graminis Pers.," unpublished Master's Thesis, University of Minnesota, June, 1924. Having once determined the susceptibility or immunity of all species and hybrids of Berberis, these important data can be used in regulating their transportation and sale. Native species of barberry also are being studied in their natural habitat and effective methods of eradication of susceptible species determined. A species which appears to be Berberis canadensis Miller was found along the Tippecanoe River in Carroll, White and Pulaski counties, Indiana. In 1924 a small area was found along Wild Cat River in Tippecanoe County, Indiana, and another area along the banks of Spring Lake near the Illinois River in Tazewell County, Illinois. Previously this species was not known to be growing in the eradication area. Its occurrence had been reported in the Appalachian region of Virginia, West Virginia, the Carolinas, and Georgia and in the Ozarks of Missouri. Berberis canadensis Miller is naturally susceptible and spreads stem rust to grains and grasses. In certain localities it is a great menace to small-grain growing and should be eradicated. Limited experiments show that bushes of this species may be eradicated by the application of salt or kerosene.

Effect of Chemicals on the Soil

Chemical studies and observations have been made of the soil-sterilizing effects of salt, kerosene, and sodium arsenite used in killing barberries. The results are summarized in Department publications, "Chemical Eradication of the Common Barberry," U. S. Dept. Agr. Circ. 332, by Noel F. Thompson (in press), and "Some Effects of Sodium Arsenite When Used to Kill Common Barberry," U. S. Dept. Agr. Bul. 1316, by E. R. Schulz and Noel F. Thompson (in press). In the treatment of barberries either 10 pounds of salt or a gallon of kerosene, applied to about one square foot area of soil, will kill all surface vegetation in that area. On fairly level land the sterile area ordinarily will not be larger than the area treated, that is, the sterile area resulting from the treatment will not be more than was previously occupied by the barberry. When salt is applied to barberries in the north-central part of the United States where the annual rainfall is 30 inches or more, the ground will be more or less covered by vegetation during the second summer after treatment and, by the third year, little difference between treated and untreated ground can be noticed. As a result of irrigation or cultivation, the time during which the ground remains sterile is lessened. In the more arid parts of the country sterility lasts longer. The soil will not remain sterile quite as long after a kerosene treatment as after salt. Soil treated with sodium arsenite shows rapid leaching where rainfall is abundant.

Relation of Seasonal Storage of Reserve Food to Successful Eradication

Investigations of the seasonal change of the storage products of barberries have been in progress since September, 1922. This work has been completed and a manuscript is being prepared for publication. The substances studied are sugar, starch, hemicellulose, nitrogen, ether extract, moisture and ash. The chemicals used in killing barberries are effective at practically any season of the year and there is no apparent correlation between the amount of the storage products present and the rapidity of killing the bush. There may be a relation between the storage products present and the success of digging. Additional investigations are in progress upon the effect of cutting off all stems of a barberry and keeping the crown in darkness and upon the action of salt in killing barberry bushes.

Stem-Rust Investigations

The barberry eradication field forces carry out a portion of the stem-rust studies in cooperation with epidemiology forces of the stem-rust project of the Office of Cereal Investigations. This work is conducted in the 13 eradication States and in other principal grain-growing States from the field headquarters at St. Paul, Minnesota. Special epidemiology field men cooperate with the State leaders and their assistants. These investigations include (1) overwintering studies, (2) the finding, tracing and mapping of local or more widespread epidemics and the determining of possible sources of inoculum, (3) the relation of weather conditions to the spread of rust, and (4) estimates of severity of epidemics and the losses produced.

SUMMARIZED RESULTS

Summary for 1924

During the calendar year 1924 approximately 124 counties were covered in original survey, approximately 60 counties were surveyed a second time, and the equivalent of 203 counties was covered in resurvey. Original bushes numbering 295,814 were found on 5,250 properties, and 388,632 bushes were destroyed on 6,335 properties. These totals include 4,841 bushes found on 695 properties in second survey. In resurvey, 21,852 sprouting bushes were found and 21,850 were eradicated. Seedlings numbering 847,771 were found in original survey, second survey and resurvey. A summary of the data is contained in tables 1, 2, 5, 6, 9, 10, 13 and 15.

Summary of Results for Seven Years

In the seven years of the campaign, from April 1, 1918, to December 31, 1924, the equivalent of approximately 786 counties has been covered in the original farm-to-farm survey. The original survey of practically all cities in the entire 13 States has been completed. Of the counties already covered by the original survey approximately 111 have been surveyed a second time. In continuing the resurvey it has been necessary to revisit the properties in approximately all counties covered by the original survey to June 30, 1923. Original bushes numbering 6,358,343 have been located on 68,465 properties. Of these, 5,813, 192 bushes have been destroyed on 67,510 properties. In resurvey, 273,619 sprouting bushes were found on 10,925 properties and 272,593 sprouting bushes were destroyed from 10,902 properties. In all surveys, 4,607,142 seedlings were found, 4,548,956 were destroyed. These numbers include 10,106 bushes and 9,579 seedlings found and 10,086 bushes and 9,579 seedlings destroyed on second survey. This makes a grand total of 11,239,104 bushes, sprouting bushes and seedlings found and 10,634,741 bushes, sprouting bushes and seedlings destroyed in all surveys in the entire campaign. These data are summarized in Table 17.

ORIGINAL SURVEY; PROPERTIES, 1924.

Table 1. Data showing, by States, the numbers of properties on which barberry bushes were found and destroyed in all surveys, and the numbers of properties upon which seedlings were found and destroyed in the original and second surveys, January 1 to December 31, 1924.

State	Numbers of counties covered in original survey	Number of properties on which bushes were found: In cities and towns	In Country: Having escaped bushes.	In Country: Total	Total in cities and country	Total number of properties cleared of bushes: Dug	Treated	Total	Number of properties on which seedlings were - Found	Destroyed: Dug	Treated	Total
Colorado	0	1	2	9	10	1	7	8	0	0	0	0
Illinois	16.25	805	232	642	1447	1297	448	1745	59	46	13	59
Indiana	22.90	114	64	150	264	147	152	299	20	9	11	20
Iowa	7.00	51	77	207	258	103	159	262	13	4	9	13
Michigan	21.30	262	247	526	788	892	290	1182	151	143	8	151
Minnesota	0	33	38	137	170	56	114	170	20	5	15	20
Montana	7.01	16	6	21	37	22	15	37	1	1	0	1
Nebraska	0	28	23	78	106	33	75	108	7	2	5	7
North Dakota	4.00	11	0	23	34	7	27	34	0	0	0	0
Ohio	21.00	1061	157	593	1654	1671	221	1892	7	0	7	7
South Dakota	2.00	41	12	41	82	43	139	182	1	0	1	1
Wisconsin	22.00	176	128	224	400	259	157	416	42	21	13	34
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	123.46	2599	986	2651	5250	4531	1804	6335	321	231	82	313

Table 2. Data showing, by States, the numbers of barberry bushes found and destroyed in all surveys, and the numbers of seedlings found and destroyed in the original and second surveys, January 1 to December 31, 1924

State	Number of bushes found				Number of bushes destroyed			Number of seedlings			
		In Country							Destroyed		
	In cities and towns	Escaped	Total	Total	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	7	99	119	126	4	111	115	0	0	0	0
Illinois	5,709	77,861	85,455	91,164	16,295	81,364	97,659	12,120	8,728	3,392	12,120
Indiana	663	48,118	48,801	49,464	515	76,077	76,592	6,718	551	6,167	6,718
Iowa	471	2,921	4,369	4,840	2,279	3,292	5,571	634	144	490	634
Michigan	1,381	115,384	116,761	118,142	66,492	64,534	131,026	599,539	561,911	37,628	599,539
Minnesota	218	1,033	1,678	1,896	308	1,588	1,896	681	270	411	681
Montana	108	131	233	341	730	256	986	167	167	0	167
Nebraska	173	292	867	1,040	397	812	1,209	4,567	515	4,052	4,567
North Dakota	34	0	289	323	24	299	323	0	0	0	0
Ohio	7,114	8,364	11,611	18,725	13,838	8,790	22,628	19,765	0	19,765	19,765
South Dakota	529	2,064	2,286	2,815	1,039	6,783	7,822	70	0	70	70
Wisconsin	758	5,677	6,180	6,938	40,285	2,520	42,805	14,898	5,461	6,151	11,612
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	17,165	261,944	278,649	295,814	142,206	246,426	388,632	659,159	577,747	78,126	655,873

ORIGINAL SURVEY, PROPERTIES, 1918 - 1924

Table 3. Data showing, by States, the numbers of properties upon which barberry bushes were found and destroyed in all surveys, and the numbers of properties upon which seedlings were found and destroyed in the original and second surveys, April 1, 1918, to December 31, 1924.

State	Numbers of counties covered by original survey	Number of properties on which bushes were found				Total number of properties cleared of bushes			Number of properties on which seedlings were -			
		In cities and towns	In country having escaped bushes	Total in country	Total in cities and country	Dug	Treated	Total	Found	Destroyed: Dug	Destroyed: Treated	Destroyed: Total
Colorado	31.49	1,544	57	162	1,706	1,644	59	1,703	0	0	0	0
Illinois	43.25	9,787	971	2,436	12,223	11,095	1,082	12,177	121	82	39	121
Indiana	92.00	3,536	278	1,138	4,674	4,309	348	4,657	33	17	16	33
Iowa	99.00	7,009	677	2,553	9,562	8,966	595	9,561	39	23	16	39
Michigan	52.30	5,040	1,532	5,137	10,177	8,892	598	9,490	375	328	47	375
Minnesota	85.33	3,137	453	1,881	5,018	4,850	168	5,018	361	342	19	361
Montana	21.13	186	10	72	258	232	25	257	2	1	1	2
Nebraska	92.50	3,191	87	677	3,868	3,652	206	3,858	16	3	13	16
North Dakota	53.00	521	1	314	835	751	84	835	2	1	1	2
Ohio	68.00	7,412	319	2,048	9,460	9,042	328	9,370	21	12	9	21
South Dakota	69.00	486	108	549	1,035	793	242	1,035	88	81	7	88
Wisconsin	71.00	6,883	1,029	2,678	9,561	8,716	748	9,464	125	48	62	110
Wyoming	8.00	74	1	14	88	84	1	85	0	0	0	0
Total	786.00	48,806	5,523	19,659	68,465	63,026	4,484	67,510	1,183	938	230	1,168

ORIGINAL SURVEY, BUSHES AND SEEDLINGS, 1918 - 1924

Table 4. Data showing, by States, the numbers of barberry bushes found and destroyed in all surveys, and the numbers of seedlings found and destroyed in the original and second surveys, April 1, 1918, to December 31, 1924

State	Number of bushes found				Number of bushes destroyed			Number of seedlings			
		In country							Destroyed		
	In cities and towns	Escaped	Total	Total	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	19,593	2,645	4,757	24,350	23,833	505	24,338	0	0	0	0
Illinois	106,872	127,082	165,679	272,551	161,138	105,227	266,365	1,530,434	16,758	1,513,676	1,530,434
Indiana	77,220	102,724	117,560	194,780	97,524	96,356	193,880	6,962	747	6,215	6,962
Iowa	649,279	58,084	142,597	791,876	773,122	18,750	791,872	3,014	730	2,284	3,014
Michigan	53,827	343,633	412,987	466,814	365,132	78,441	443,573	780,792	710,338	70,454	780,792
Minnesota	592,361	81,177	191,863	784,224	780,204	4,020	784,224	20,278	19,553	725	20,278
Montana	6,884	879	3,308	10,192	9,542	639	10,181	812	167	645	812
Nebraska	73,081	5,683	21,192	94,273	90,450	3,787	94,237	6,735	915	5,820	6,735
North Dak.	14,401	150	7,744	22,145	19,561	2,584	22,145	156	150	6	156
Ohio	215,104	29,989	45,969	261,073	240,820	15,675	256,495	20,601	276	20,325	20,601
S. Dakota	23,654	20,727	35,486	59,140	48,650	10,490	59,140	17,258	16,579	679	17,258
Wisconsin	280,608	3,080,555	3,092,175	3,372,783	2,844,217	18,557	2,862,774	34,884	10,237	16,461	26,698
Wyoming	3,946	1	196	4,142	3,966	2	3,968	0	0	0	0
Total	2,116,830	3,853,329	4,241,513	6,358,343	5,458,159	355,033	5,813,192	2,421,926	776,450	1,637,290	2,413,740

SECOND SURVEY, PROPERTIES, 1924

Table 5. Data showing, by States, the numbers of properties upon which barberry bushes and seedlings were found and destroyed on second survey in the barberry eradication campaign from January 1, 1924, to December 31, 1924.

State	Numbers of counties surveyed	Number of properties on which bushes were found				Total number of properties cleared of bushes			Number of properties on which seedlings were -			
		In cities and towns	In country		Total in cities and country	Dug	Treated	Total	Found	Destroyed		
			Having escaped bushes	Total						Dug	Treated	Total
Colorado	3.69	0	1	3	3	0	3	3	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0	0	0
Indiana	.10	39	0	0	39	40	1	41	0	0	0	0
Iowa	4.00	9	39	74	83	24	59	83	9	1	8	9
Michigan	2.33	44	15	49	93	68	25	93	3	3	0	3
Minnesota	13.70	33	38	137	170	56	114	170	20	5	15	20
Montana	5.50	0	0	1	1	1	0	1	0	0	0	0
Nebraska	8.50	19	18	68	87	26	63	89	5	2	3	5
North Dakota	11.40	8	0	19	27	7	20	27	0	0	0	0
Ohio	2.00	18	0	7	25	24	1	25	0	0	0	0
South Dakota	5.78	21	0	16	37	8	29	37	0	0	0	0
Wisconsin	2.20	44	55	86	130	60	70	130	9	5	4	9
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	59.20	235	166	460	695	314	385	699	46	16	30	46

SECOND SURVEY, BUSHES AND SEEDLINGS, 1924

Table 6. Data showing, by States, the numbers of barberry bushes and seedlings found and destroyed on second survey in the barberry eradication campaign from January 1, 1924, to December 31, 1924

State	Number of bushes found			Number of bushes destroyed			Number of seedlings			
	In cities and towns	In country					Found	Destroyed		
		Escaped	Total	Total	Dug	Treated	Total		Dug	Treated	Total
Colorado	0	1	3	3	0	3	3	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0	0
Indiana	145	0	0	145	150	1	151	0	0	0	0
Iowa	77	324	761	838	183	655	838	475	30	445	475
Michigan	91	82	170	261	204	57	261	40	40	0	40
Minnesota	217	450	1,057	1,274	267	1,007	1,274	681	270	411	681
Montana	0	0	1	1	1	0	1	0	0	0	0
Nebraska	146	248	659	805	417	564	981	567	515	52	567
North Dakota	28	0	263	291	24	267	291	0	0	0	0
Ohio	59	0	31	90	88	2	90	0	0	0	0
South Dakota	56	0	149	205	16	189	205	0	0	0	0
Wisconsin	183	652	745	928	150	778	928	6,940	3,640	3,300	6,940
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	1,002	1,757	3,839	4,841	1,500	3,523	5,023	8,703	4,495	4,208	8,703

SECOND SURVEY, PROPERTIES, 1922- 1924

Table 7. Data showing, by States, the numbers of properties upon which barberry bushes and seedlings were found and destroyed on second survey in the barberry eradication campaign from January 1, 1922, to December 31, 1924

State	Numbers of counties surveyed	Number of properties on which bushes were found: In cities and towns	In country: Having escaped bushes	In country: Total	Total in cities and country	Total number of properties cleared of bushes: Dug	Treated	Total	Number of properties on which seedlings were - Found	Destroyed: Dug	Treated	Total
Colorado	15.69	0	15	27	27	3	24	27	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0	0	0
Indiana	4.10	66	2	20	86	68	18	86	0	0	0	0
Iowa	6.00	11	55	103	114	30	83	113	10	1	9	10
Michigan	2.33	44	15	49	93	68	25	93	3	3	0	3
Minnesota	29.95	50	46	200	250	127	123	250	21	6	15	21
Montana	5.50	0	0	1	1	1	0	1	0	0	0	0
Nebraska	14.00	45	25	116	161	46	113	159	9	2	7	9
North Dakota	20.40	10	0	50	60	11	49	60	1	0	1	1
Ohio	2.00	18	0	7	25	24	1	25	0	0	0	0
South Dakota	9.02	27	0	29	56	8	48	56	1	1	0	1
Wisconsin	2.20	44	55	86	130	60	70	130	9	5	4	9
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	111.19	315	213	688	1,003	446	554	1,000	54	18	36	54

Table 8. Data showing, by States, the numbers of barberry bushes and seedlings found and destroyed on second survey in the barberry eradication campaign from January 1, 1922, to December 31, 1924

State	Number of bushes found				Number of bushes destroyed			Number of seedlings			
	In cities and towns	In country		Total				Found	Destroyed		
		Escaped	Total		Dug	Treated	Total		Dug	Treated	Total
Colorado	0	43	75	75	6	69	75	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0	0
Indiana	197	15	85	282	212	70	282	0	0	0	0
Iowa	79	484	981	1,060	192	865	1,057	500	30	470	500
Michigan	91	82	170	261	204	57	261	40	40	0	40
Minnesota	318	775	2,441	2,759	1,472	1,287	2,759	711	300	411	711
Montana	0	0	1	1	1	0	1	0	0	0	0
Nebraska	468	342	1,679	2,147	543	1,587	2,130	985	515	470	985
North Dakota	64	0	1,354	1,418	59	1,359	1,418	3	0	3	3
Ohio	59	0	31	90	88	2	90	0	0	0	0
South Dakota	266	0	819	1,085	44	1,041	1,085	400	400	0	400
Wisconsin	183	652	745	928	150	778	928	6,940	3,640	3,300	6,940
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	1,725	2,396	8,381	10,106	2,971	7,115	10,086	9,579	4,925	4,654	9,579

RESURVEY, PROPERTIES, 1924

Table 9. Data showing, by States, the numbers of properties upon which sprouting bushes and seedlings were found and destroyed on resurvey in the barberry eradication campaign from January 1 to December 31, 1924

State	Number of Properties on which sprouting bushes were found –			Total Number of Properties cleared of sprouting bushes:				Number of Properties on which Seedlings were –			
		In country							Destroyed		
	In cities and towns:	Having escaped bushes	Total	Total in cities and country	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	32	20	28	60	3	59	62	37	3	34	37
Illinois	96	64	169	265	122	143	265	62	59	3	62
Indiana	7	1	1	8	7	1	8	0	0	0	0
Iowa	41	75	258	299	121	179	300	61	42	19	61
Michigan	33	49	67	100	70	30	100	52	49	3	52
Minnesota	13	38	93	106	41	65	106	53	21	32	53
Montana	11	1	10	21	13	8	21	6	6	0	6
Nebraska	11	1	18	29	11	16	27	4	3	1	4
N. Dakota	28	0	35	63	13	50	63	0	0	0	0
Ohio	479	66	287	766	696	70	766	199	165	34	199
S. Dakota	29	14	48	77	8	69	77	34	2	32	34
Wisconsin	39	60	127	166	92	74	166	56	39	17	56
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	819	389	1,141	1,960	1,197	764	1,961	564	389	175	564

Table 10. Data showing, by States, the numbers of sprouting bushes and seedlings found and destroyed on resurvey in barberry eradication campaign from January 1 to December 31, 1924

State	Number of sprouting bushes found				Number of sprouting bushes destroyed			Number of Seedlings			
	In cities and towns	In Country							Destroyed		
		Escaped	Total	Total	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	83	222	319	402	17	388	405	771	95	676	771
Illinois	923	765	3,339	4,253	1,027	3,226	4,253	34,913	33,158	1,755	34,913
Indiana	14	1	1	15	14	1	15	0	0	0	0
Iowa	197	990	3,024	3,221	626	2,593	3,219	3,503	2,459	1,044	3,503
Michigan	164	375	484	648	269	379	648	81,770	21,715	60,055	81,770
Minnesota	48	480	1,076	1,124	182	942	1,124	6,385	253	6,132	6,385
Montana	89	3	331	420	358	62	420	244	244	0	244
Nebraska	39	25	91	130	54	73	127	108	106	2	108
North Dakota	158	0	720	878	68	810	878	0	0	0	0
Ohio	2,226	974	1,893	4,119	3,025	1,094	4,119	50,813	10,393	40,420	50,813
South Dakota	270	63	233	503	10	493	503	937	224	713	937
Wisconsin	447	5,235	5,692	6,139	966	5,173	6,139	9,168	4,062	5,106	9,168
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	4,658	9,133	17,194	21,852	6,616	15,234	21,850	188,612	72,709	115,903	188,612

RESURVEY, PROPERTIES, 1918 - 1924

Table 11. Data showing, by States, the numbers of properties upon which sprouting bushes and seedlings were found and destroyed on resurvey in the barberry eradication campaign from April 1, 1918, to December 31, 1924

State	Number of Properties on Which Sprouting bushes were found			Total number of properties cleared of sprouting bushes				Number of properties on which seedlings were -			
	In cities and towns	In country: Having escaped bushes	In country: Total	Total in cities & country	Dug	Treated	Total	Found	Destroyed: Dug	Destroyed: Treated	Destroyed: Total
Colorado	1,426	90	158	1,584	1,411	172	1,583	81	17	64	81
Indiana	328	264	564	892	388	504	892	236	188	48	236
Illinois	151	100	195	346	247	95	342	25	3	22	25
Iowa	279	202	702	981	570	411	981	138	87	51	138
Michigan	136	108	281	417	367	50	417	187	183	4	187
Minnesota	681	498	1,053	1,734	1,496	238	1,734	2,158	2,062	96	2,158
Montana	104	1	45	149	141	8	149	7	6	1	7
Nebraska	191	15	330	521	331	188	519	25	11	14	25
North Dakota	204	0	147	351	217	134	351	0	0	0	0
Ohio	1,045	137	617	1,662	1,567	95	1,662	303	257	46	303
South Dakota	339	33	325	664	510	154	664	65	23	42	65
Wisconsin	853	540	745	1,598	1,252	334	1,586	163	98	64	162
Wyoming	21	0	5	26	18	4	22	6	0	6	6
Total	5,758	1,988	5,167	10,925	8,515	2,387	10,902	3,394	2,935	458	3,393

Table 12. Data showing, by States, the numbers of sprouting bushes and seedlings found and destroyed on resurvey in the barberry eradication campaign from April 1, 1918, to December 31, 1924

State	Number of sprouting bushes found				Number of sprouting bushes destroyed			Number of seedlings			
	In cities and towns	In country		Total	Dug	Treated	Total	Found	Destroyed		
		Escaped	Total						Dug	Treated	Total
Colorado	3,780	1,870	2,920	6,700	5,136	1,563	6,699	2,502	707	1,795	2,502
Illinois	4,136	3,881	8,923	13,059	5,515	7,544	13,059	63,397	47,746	15,651	63,397
Indiana	1,481	16,640	17,993	19,474	17,446	1,723	19,169	3,262	255	3,007	3,262
Iowa	3,536	5,932	15,034	18,570	9,786	8,432	18,218	31,645	26,362	5,283	31,645
Michigan	511	1,142	2,357	2,868	2,206	662	2,868	607,161	547,076	60,085	607,161
Minnesota	13,790	14,763	33,354	47,144	39,954	7,190	47,144	24,939	2,389	22,550	24,939
Montana	3,454	3	1,609	5,063	5,001	62	5,063	889	244	645	889
Nebraska	5,972	82	9,519	15,491	12,386	3,102	15,488	2,630	954	1,676	2,630
North Dakota	336	0	834	1,170	172	998	1,170	0	0	0	0
Ohio	4,426	6,589	9,075	13,501	10,861	2,640	13,501	252,473	69,603	182,870	252,473
South Dakota	20,978	5,282	22,002	42,980	36,615	6,365	42,980	8,996	6,393	2,603	8,996
Wisconsin	11,030	72,782	76,190	87,220	19,007	67,906	86,913	1,187270	60,962	1,076,308	1,137,270
Wyoming	356	0	23	379	305	16	321	52	52	0	52
TOTAL	73,786	128,966	199,833	273,619	164,390	108,203	272,593	2185216	762,743	1,372,473	2,135,216

CHEMICAL TREATMENT, 1924

Table 13. Data showing, by States, the numbers of properties on which barberry bushes and sprouting barberry bushes were treated with chemicals; and the numbers of bushes, sprouting bushes and seedlings treated from January 1 to December 31, 1924

State	Number treated											
	With Salt			With Sodium Arsenite			With Kerosene			Total		
	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings
Col.	66	499	676	0	0	0	0	0	0	66	499	676
Ill.	580	83,407	5,147	6	14	0	5	1,169	0	591	84,590	5,147
Ind.	153	76,078	6,167	0	0	0	0	0	0	153	76,078	6,167
Iowa	323	5,724	1,531	0	0	0	16	161	3	339	5,885	1,534
Mich.	189	4,008	55	0	0	0	131	60,905	97,628	320	64,913	97,683
Minn.	179	2,530	6,543	0	0	0	0	0	0	179	2,530	6,543
Mont.	23	318	0	0	0	0	0	0	0	23	318	0
Neb.	50	546	4,000	0	0	0	41	339	54	91	885	4,054
N. Dak.	77	1,109	0	0	0	0	0	0	0	77	1,109	0
Ohio	212	6,732	50,185	0	0	0	79	3,152	10,000	291	9,884	60,185
S. Dak.	201	7,266	767	0	0	0	7	10	16	208	7,276	783
Wisc.	231	7,693	11,257	0	0	0	0	0	0	231	7,693	11,257
Wyo.	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,284	195,910	86,328	6	14	0	279	65,736	107,701	2,569	261,660	194,029

Table 14. Data showing, by States, the numbers of properties on which barberry bushes and sprouting barberry bushes were treated with chemicals; and the numbers of bushes, sprouting bushes and seedlings treated from April 1, 1918, to December 31, 1924

State	Number treated											
	With Salt			With Sodium Arsenite			With Kerosene			Total		
	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings
Colorado	231	2,068	1,795	0	0	0	0	0	0	231	2,068	1,795
Illinois	1,547	110,763	1,529,327	34	839	0	5	1,169	0	1,586	112,771	1,529,327
Indiana	443	98,079	9,222	0	0	0	0	0	0	443	98,079	9,222
Iowa	988	26,911	7,564	0	0	0	18	271	3	1,006	27,182	7,567
Michigan	278	9,604	3,000	239	8,594	29,911	131	60,905	97,628	648	79,103	130,539
Minnesota	379	11,100	23,143	25	85	102	2a	25a	30a	406	11,210	23,275
Montana	33	701	1,290	0	0	0	0	0	0	33	701	1,290
Nebraska	353	6,550	7,442	0	0	0	41	339	54	394	6,889	7,496
N. Dakota	197	3,515	6	21	67	0	0	0	0	218	3,582	6
Ohio	254	9,391	92,945	10	1,069	59,300	159	7,855	50,950	423	18,315	203,195
S. Dakota	389	16,845	3,266	0	0	0	7	10	16	396	16,855	3,282
Wisconsin	731	80,638	1,091,067	350	5,824	1,702	1b	1b	0	1,082	86,463	1,092,769
Wyoming	7	18	0	0	0	0	0	0	0	7	18	0
Total	5,830	376,183	2,770,067	679	16,478	91,015	364	70,575	148681	6,873	463,236	3,009,763

a. Killed with drip oil.
b. Killed with carbon bisulphide.

CHEMICALS, QUANTITIES USED, 1924

Table 15. Data showing, by States, the quantities of chemicals used in the barberry eradication campaign, January 1 to December 31, 1924

STATE	SALT (Tons)					SODIUM ARSENITE (Gallons)			KEROSENE (Gallons)		
	Furnished by					Furnished by			Furnished by		
	Property Owner	State Agency	Conference: P. G. Rust	U. S.D.A	Total	Conference: P. G. Rust	U.S.D.A.	Total	Owner	U.S.D.A.	Total
Colorado	0:	0:	0:	.780:	.780:	0:	0:	0:	0:	0:	0
Illinois	.650:	1.650:	0:	127.000:	129.300:	0:	27:	27:	0:	124:	124
Indiana	.728:	0:	0:	32.262:	32.990:	0:	0:	0:	0:	0:	0
Iowa	6.774:	0:	.483:	15.634:	22.891:	0:	0:	0:	224:	0:	224
Michigan	.030:	0:	1.491:	12.681:	14.202:	0:	0:	0:	0:	10,811:	10811
Minnesota	.300:	.833:	.721:	3.949:	5.803:	0:	0:	0:	0:	0:	0
Montana	.125:	0:	0:	1.808:	1.933:	0:	0:	0:	0:	0:	0
Nebraska	.005:	0:	.350:	7.772:	8.127:	0:	0:	0:	0:	446:	446
N. Dakota	3.660:	1.500:	0:	.800:	5.960:	0:	0:	0:	0:	0:	0
Ohio	.432:	24.491:	0:	1.909:	26.832:	0:	0:	0:	16:	1,722a:	1,738a
S. Dakota	10.425:	0:	0:	2.150:	12.575:	0:	0:	0:	0:	15:	15
Wisconsin	.085:	32.750:	0:	2.030:	34.865:	0:	0:	0:	0:	0:	0
Wyoming	0:	0:	0:	0:	0:	0:	0:	0:	0:	0:	0
Total	23.214:	61.224:	3.045	208.775:	296.258:	0:	27:	27:	240:	13,118:	13,358

a. 1515 gallons kerosene furnished by the State included.

Table 16. Data Showing, by States, the quantities of chemicals used in the barberry eradication campaign April 1, 1918 to December 31, 1924

STATE	SALT (Tons)					SODIUM ARSENITE (Gallons)			KEROSENE (Gallons)		
	Furnished by					Furnished by			Furnished by		
	Property Owner	State Agency	Conference: P. G. Rust	U.S.D.A.	Total	Conference: P. G. Rust	U.S.D.A.	Total	Owner	U.S.D.A.	Total
Colorado	0:	0:	0:	3.640:	3.640:	0:	0:	0:	0:	0:	0
Illinois	.750:	50.650:	31.000:	226.000:	308.400:	0:	77:	77:	0:	124:	124
Indiana	.819:	0:	0:	53.332:	54.151:	0:	0:	0:	0:	0:	0
Iowa	38.283:	0:	19.898:	41.365:	99.546:	0:	0:	0:	382:	0:	382
Michigan	.030:	0:	8.491:	26.022:	34.543:	175.6:	129.3:	3 04.9:	0:	10,811:	10,811
Minnesota	.347:	.833:	9.211:	21.826:	32.217:	0:	23.2:	23.2:	0:	0a:	0a
Montana	.125:	0:	0:	3.758:	3.883:	0:	0:	0:	0:	0:	0
Nebraska	.018:	0:	8.550:	15.062:	23.630:	0:	0:	0:	0:	446:	446
N. Dakota	9.160:	5.000:	0:	4.300:	18.460:	0:	7:	7:	0:	0:	0
Ohio	.668:	26.376:	0:	5.128:	32.172:	16.2:	30.1:	46.3:	230:	3,003c:	3,233c
S. Dakota	13.845:	0:	17.850:	2.150:	33.845:	0:	0:	0:	0:	15:	15
Wisconsin	.220:	56.650:	70.000:	24.950:	151.820:	408.0:	190.0:	598.0:	0:	0b:	0b
Wyoming	0:	0:	0:	.100:	.100:	0:	0:	0:	0:	0:	0
Total	64.265:	139.509:	165.000:	427.633:	796.407:	599.8:	456.6:	1,056.4:	612:	14,399:	15,011

a. 10 gallons drip oil used.
b. .3 gallon carbon bisulphide used.
c. 1919 gallons kerosene furnished by the State included.

GRAND SUMMARY, ORIGINAL BUSHES, SPROUTING BUSHES, AND SEEDLINGS, 1918 - 1924

Table 17. Data showing, by States, the numbers of bushes, sprouting bushes and seedlings found and destroyed in all surveys in the barberry eradication campaign, April 1, 1918 to December 31, 1924

State	Original bushes		Sprouting bushes		Seedlings	
	Found	Destroyed	Found	Destroyed	Found	Destroyed
Colorado	24,350	24,338	6,700	6,699	2,502	2,502
Illinois	272,551	266,365	13,059	13,059	1,593,831	1,593,831
Indiana	194,780	193,880	19,474	19,169	10,224	10,224
Iowa	791,876	791,872	18,570	18,218	34,659	34,659
Michigan	466,814	443,573	2,868	2,868	1,387,953	1,387,953
Minnesota	784,224	784,224	47,144	47,144	45,217	45,217
Montana	10,192	10,181	5,063	5,063	1,701	1,701
Nebraska	94,273	94,237	15,491	15,488	9,365	9,365
North Dakota	22,145	22,145	1,170	1,170	156	156
Ohio	261,073	256,495	13,501	13,501	273,074	273,074
South Dakota	59,140	59,140	42,980	42,980	26,254	26,254
Wisconsin	3,372,783	2,862,774	87,220	86,913	1,222,154	1,163,968
Wyoming	4,142	3,968	379	321	52	52
Total	6,358,343	5,813,192	273,619	272,593	4,607,142	4,548,956

Grand Total of bushes, sprouting bushes and seedlings, found - 11,239,104
Grand Total of bushes, sprouting bushes and seedlings, destroyed - 10,634,741

REPORT OF PROGRESS IN EPIDEMIOLOGY OF STEM RUST OF CEREALS, 1924,

By E. B. Lambert, Assistant Pathologist in Rust Investigations.

Organization and General Plan

The studies herein recorded were made along the same general lines as in the past three years. Observations in the eastern portion of the barberry eradication area were made entirely by the eradication forces, while in the western part the epidemics were studied by special stem rust epidemiology men in cooperation with the State leaders in barberry eradication. In Texas, Oklahoma, Missouri and Kansas, the studies were made by epidemiology men in cooperation with State pathologists.

Overwintering

This season a special effort was made to compare the overwintering of the different cereal rusts which occur in the Mississippi Valley, since each rust presents a distinct problem, from the standpoint of both the host and the parasite.

Stem Rusts of Wheat and Oats

As far as conclusions can be drawn from negative results obtained in germination tests and early spring observations, the stem rusts of wheat and oats did not overwinter north of central Texas.

The most extensive overwintering studies were made in Texas and Oklahoma. Fall infection was abundant in the Panhandle of Texas, but no evidence of overwintering was obtained north of west Texas. With the exception of one field of oats, all of the overwintering occurred on volunteer or early-sown grain.

It may be possible to reduce the amount of uredinial overwintering of Puccinia graminis tritici in this region; but this would be difficult with P. graminis avenae because there is so much volunteer oats. Four control measures suggest themselves:

1. Sowing wheat late in the fall;

2. Development and distribution of good winter wheat sufficiently resistant to stem rust to prevent overwintering;

3. Elimination of local sources of fall inoculum (principally Elymus sp.);

4. Replacing wheat, sown early for fall forage and chicken greens, with oats or other suitable forage crop not susceptible to stem rust.

Stem Rust of Rye

Rye is a cool-weather crop and is not grown extensively south of the spring-wheat area. No evidence of uredinial overwintering was obtained from germination tests or early-spring observations.

Stem Rust of Timothy

The uredinial stage of this rust overwintered in Colorado and Minnesota. It has been previously shown to overwinter throughout the northern Mississippi Valley.

Leaf Rusts of Wheat and Rye, and Crown Rust of Oats

The uredinial stage of Puccinia triticina apparently overwintered throughout the entire Mississippi Valley. Its development was traced through the winter in Oklahoma and Texas. Winter wheat was infected on May 1 at University Farm, St. Paul. In Minnesota the orange leaf rust seemed to live through the winter as dormant mycelium since the spores lost their viability at about the same time as stem rust spores.

The uredinial mycelium of Puccinia dispersa also overwintered in Colorado and Minnesota.

Urediniospores of the crown rust of oats overwintered in Texas, but no evidence of overwintering was obtained in the States farther north.

The First Appearance and Spread of Rust

Stem Rust of Wheat and Oats

In 1924 the stem-rust epidemics on both wheat and oats developed much later than usual. As a consequence, the epidemics were light and did comparatively little damage. A scattered infection appeared first in southern Texas, then farther and farther north as the season progressed. Aecia appeared on barberries in most localities in the eradication area a month before grains and grasses were infected. Local epidemics were found near barberries from a week to two weeks before infection became fairly general. In the eastern portion of the eradication area all cases of severe infection on grains or grasses were traced to barberries. In some localities in the western portion, however, barberry infection may not have been a sufficient source of inoculum to account satisfactorily for the epidemic.

The first reports of stem rust infection on barberries, on grains and grasses near barberries, and on grains and grasses distant from barberries are given in Tables 1, 2, and 3.

A spotted type of infection occurred in northern Texas during the latter part of May. This rust was attributed to wind blown spores from fields where the rust had overwintered farther south. Since the rust did not become prevalent in this region until almost harvest time, very little loss resulted. On the other hand, the heavily rusted spots were from thirty to forty feet in diameter at harvest time and considerable inoculum must have been scattered during the first week in June.

Table 1. First Reports of Stem Rust on Barberries, 1924

State	County	Nearest town	Stage of development	Date	Observer
Iowa	Ringgold	Redding	Pyonial	4/26	Fletcher
Wisconsin	Dane	Black Earth	do	4/29	Thompson and Walker
Missouri	Marion	Hannibal	do	do	Fletcher
Indiana	Tippecanoe	LaFayette	do	5/3	Leer
Ohio	Shelby	Sydney	Aecial	5/9	Beck and Lafferty
Illinois	Montgomery	Rosemond	Pycnial	5/10	Curran
	Lake	Gurnee	do	do	Schulz and Thompson
Minnesota	Goodhue	Red Wing	do	5/12	Melander
Nebraska	Lancaster)		do	5/14	Thiel
	Saunders)				
Ohio	Highland	Hillsboro	Aecial	5/15	Beck and Lafferty
N. Kansas	-	Abilene	do	5/19	Lambert
S. Dakota	Moody	Flandreau	Pycnial	5/21	Bulger
Michigan	Jackson		Aecial	5/26	Reddy
Minnesota	Faribault		do	6/2	Melander
Colorado	Larimer	Ft. Collins	do	6/10	Lungren
Maryland		Bell	do	6/5	Humphrey, et al.
Wyoming	Laramie	Cheyenne	Pycnial	6/16	Lungren
Montana		Bozeman	Aecial	7/1	Christopher

Table 2. First Reports of Stem Rust on Grains and Grasses Traceable to Barberries, 1924

State	County	Nearest town	Grain or Grass	Degree of Infection	Date	Observer
Kansas	[illegible]	Salina	Elymus can.	Trace	6/7	Butler
Nebraska	Lancaster	-	Western			
			wheat grass	do	6/9	Thiel
Wisconsin	Dane	Madison	Quack grass	do	6/10	Walker
Iowa	Ringgold	Redding	H. jubatum	do	6/8	Fletcher
				Heavy for 50 feet	6/17	do
Minnesota	Rice	Northfield	Quack grass	Trace	6/18	Christensen Bros.
	Swift	Benson	Rye	do	6/21	Anderson
	Goodhue	Goodhue	do	do	6/23	Melander
Illinois	Kane	Huntley	Barley	Slight	6/15	S. S.
			H. jubatum	Heavy	do	Muncie
S. Dakota	Hamblin	Estelline	do	Light	6/23	Bulger
Wisconsin	Dane	Black Earth	Blue grass	?	6/18	Stiles
Missouri	Grundy	Gilman	H. jubatum	Trace	6/15	Fletcher
			Agrostis			
			alba	do	do	do

Table 3. First Reports of Stem Rust on Grains and Grasses Not Directly Traceable to Barberries, 1924

State	Nearest town	Grain or Grass	Degree of Infection	Date	Observer
Texas		Overwintered		April-May	Butler, Frolik
Oklahoma	Duncan	Wheat	Trace	6/4	Butler
Kansas	Wellington	do	1 pustule	6/6	do
Missouri	Warranton	Oats	do	6/12	Fletcher
	Hamilton	Wheat	2d generation	6/22	Lambert
Iowa	Mt. Ayre	Oats	1 pustule	6/16	Fletcher
	Des Moines	Wheat	2d generation	6/23	Lambert
Nebraska	Custer	Do	Trace	6/18	Thiel
Minnesota	Luverne	Oats	1 pustule	do	Ostrom
	Marshall	Wheat	do	6/27	Dunn
Illinois	Ridgeway	do	6-10 culms infected	6/12	Cornwell
Indiana	Lafayette	do	Trace	6/19	Leer
Colorado	Burlington	do	1 pustule	6/24	Lungren
S. Dakota	Yankton	do	Trace	6/25	Thiel
N. Dakota	Fargo	do	do	7/3	Bolley
Ohio	London	do	do	7/4	Baringer
Montana	Yates	do	do	7/17	Christopher

In Oklahoma, Kansas, Missouri, southern Illinois, and Nebraska, no appreciable loss resulted from stem rust. Infection was first observed in central Oklahoma, Kansas, Missouri, southern Illinois, and Nebraska during the second and third weeks in June. In this region barberries rusted in May but conditions were unfavorable for abundant infection. The significance of barberry infection in Kansas and Missouri could not be determined, since only a few rural barberry plantings were available for study.

The rust was found first in Colorado, South Dakota, Iowa, Minnesota, and North Dakota during the last week in June and the first week in July. It was found at Grand Forks, North Dakota, on July 13, and on the Canadian border a few days later. A center of heavy infection developed around Yankton, South Dakota, where the initial infection seemed to have occurred about June 15. Seven barberry plantings were located in this region, but the amount of inoculum spreading from these barberries did not seem abundant enough to account for all of the heavy initial infection. It may have been due to a combination of spores from local infected barberries and spores blown directly from Texas and southern Oklahoma. At the time, however (June 15), there did not seem to be sufficient inoculum in northern Oklahoma, Kansas, Missouri, Iowa, and Nebraska, or in other States in the barberry eradication area, to account for the initial infection in the Yankton area. Another center of severe infection existed at harvest time in central North Dakota. Initial infection occurred throughout this region during the second week in July. The heaviest early infection centered around Jamestown and Courteney and extended northwestward through the Kenmare region and northeastward through the Devils Lake region. Several infected barberry plantings were found near Courteney. These were located after the epidemic had become widespread, and therefore it was impossible to determine how much they had contributed to the production of the epidemic. The inoculum which caused the initial infection in this region may have come from several sources; local barberries, wind-blown urediniospores from northern Kansas, Nebraska, and the Yankton area, or aeciospores from the eastern portion of the barberry eradication area may have contributed.

In the eastern portion of the barberry eradication area, with the exception of southern Illinois and southern Indiana; stem rust did not appear on grains or grasses until July. Barberries were heavily infected throughout southeastern Minnesota, Wisconsin, northern Illinois, northern Indiana, Ohio, and Michigan. In this region local epidemics were easily traceable to barberries. In Swift County, Minnesota, stem rust on oats was traced seven miles to infected barberries. In Indiana, during the latter part of June, rust apparently spread twenty-five miles northeastward from infected barberries in the area of escapes at Ambia. Stem rust infection was extremely severe on oats near the escaped-barberry area at Trempeleau, Wisconsin. During the latter part of July, oats were heavily rusted for eighty miles northwest of this area. In Michigan an area of rusted wheat was found in Gratiot County on July 8. At this time the area comprised less than two acres adjacent to infected barberries. On July 22, the rust had spread to all of the wheat fields in four sections. Numerous other examples were noted. Mr. Reddy reported conditions in his State as follows:

"This has been a wonderful season in Michigan because all rust outbreaks can be directly associated with barberry plantings. We say it is wonderful, because the influence of barberry is so obvious that Michigan farmers having rust are enthusiastic for the eradication of barberries after making a limited number of field observations. It has never been so easy to correlate the rust and the barberries."

Stem Rust of Rye

In most rye fields no stem rust could be found. In all cases where stem rust was severe on rye or quack grass the infection was traced to barberries. In southeastern Minnesota this condition is in sharp contrast with the situation existing before the original barberry survey when stem rust infection was universal on rye and quack grass.

Leaf Rust of Wheat and Crown Rust of Oats

In general the leaf rust of wheat appeared earlier than the stem rust and the infection was lighter than in 1923. Kota wheat was again extremely susceptible in the field.

Traces of crown rust were found on oats from Texas to the Canadian border. In the northern States, however, this rust was abundant only near infected buckthorns. The local nature of the epidemics is probably due to the fact that buckthorns rust somewhat later than barberries and that oats mature earlier than spring wheat. The crown rust presumably has the same opportunity to blow up from Texas as the stem rust of oats. The reason for its failure to do so is not clear.

Results of Exposing Spore Traps

Spore traps, consisting of glass slides coated with a light film of vaseline, were exposed at forty-eight hour intervals at various places throughout the entire Mississippi Valley. The objects of these slide exposures were: To discover whether urediniospores were in the air sufficiently in advance of the initial field infection to be reckoned as a primary source of inoculum; and to obtain evidence of the relative abundance of spores in the air in different localities at the time of primary infection in the spring wheat area. The location of the various stations, the periods at which the slides were exposed, and the dates on which stem rust urediniospores were first found are shown in Table 4.

The significant facts ascertained from this work were:

1. Stem rust spores were caught on the Mexican border nearly a month before the rust became widespread in central Texas.

2. No stripe rust spores were recognized on the slides exposed near the Mexican border.

3. The rust appeared on the slides first along the Mexican border and in the San Antonio region, then farther and farther north as the season progressed; and

4. In general, rust spores were found on the slides before infection was observed in the field.

Stem Rust Losses

Severe loss from stem rust was practically confined to central North Dakota. Most of the wheat in this section is durum and consequently was not heavily infected. The loss in North Dakota probably did not exceed four or five per cent of the total wheat crop of that State.

Late fields of wheat and oats were severely rusted in southeastern South Dakota but the total loss for that State probably will not exceed one or two per cent in wheat and oats. The loss in Minnesota was estimated at one per cent in wheat and 1/2 per cent in oats.

Losses probably did not exceed one per cent in any other State.

Table 4. Appearance of Stem Rust Spores on Stationary Slides, 1924

Stations	Period exposed	Uredo-spores first found	Remarks
	1924	1924	
San Antonio, Texas	4/12-5/28	4/20	Last rain on 13th, wind prevailingly S and E.
Del Rio, "	4/13-5/4	4/20	" " " 10th, " " " " "
El Paso, "	4/12-6/6	4/23	" " " 9th, " " W (E on 18th and 19th)
Dallas, "	4/11-6/7	4/15	Light shower, wind prevailingly S and E.
Stillwater, Okla.	5/27-6/29	5/27	No rain, wind prevailingly S.
Woodward, "	5/24-7/13	5/28	Trace of rain during exposure, wind S from 5/25
St. Joseph, Mo.	5/24-7/10	6/12	Rain during exposure. Wind NE, E, SE, from 6/5
Hannibal, "	5/26-7/10	6/8	" " " " " " " " " Previously variable.
Springfield, "	5/22-7/2	6/4	Trace of rain during exposure, wind variable.
Topeka, Kansas	5/26-7/2	6/3	" " " " " " "
Concordia, "	5/26-7/6	6/1	" " " " " " northerly from 5/28
Cairo, Illinois	5/22-7/4	6/5	Light rain during exposure, wind S during 4th and 5th, chiefly northerly previous week.
Peoria, "	5/26-7/2	6/7	Light rain during exposure, wind variable.
Fort Wayne, Ind.	6/9-7/23	6/16	Heavy rain during exposure. Wind chiefly northerly from 6/10
Evansville, "	5/24-7/10	6/7	Heavy shower during exposure, wind variable.
Green Bay, Wis.	6/24-7/30	7/7	Light rain during exposure, wind variable.
La Crosse, "	6/16-7/12	7/2	" " " " " "
Sandusky, Ohio	6/9-7/22	7/2	Light showers during exposures, wind prevailingly S-W from 6/21.
Escanaba, Mich.	6/25-8/11	7/25	Light showers, wind variable.
Ludington, "	6/16-7/26	nil	No spores found on slides.
Keokuk, Iowa	6/8-7/9	6/14	Light rain during exposure, wind variable.
Morris, Minn.	6/20-8/21	7/7	No rain during exposure. Wind prevailing SE from 6/26.
Northfield, Minn.	6/27-8/2	7/7	Data not available.
Duluth, "	7/8-8/14	7/21	Heavy rain during exposure. Wind variable.
Yankton, S. D.	6/9-7/23	6/21	No rain during exposure. Wind variable.
Rapid City, S. D.	6/10-7/23	6/18	Light rain during exposure. Wind prevailingly S and E from 6/12
Brookings, "	6/13-8/4	7/7	Light rain during exposure. " " SE
Jamestown, N. D.	7/19-8/16	7/18	Earlier exposures not carried out due to absence of Mr. Calvelage.
Dickinson, "	6/27-8/4	6/27	One spore present on slide. Light shower during exposure.
Lincoln, Nebr.	6/10-7/30	6/10	Spores present on earliest exposed slides. Rain during exposure.
Ft. Collins, Colo.	6/6-7/23		
	7/24-8/6		Spores arrived during interval.

Meteorological Conditions

The crop season was unusually cool throughout the entire Mississippi Valley. This condition probably was primarily responsible for the retarded development of the rust.

At San Antonio stem rust infection and spore germination both diminished during February and reached lowest ebb in March, after a long period during which mean daily temperatures were less than 65° F. The greatest increase in rust infection came in April and May during which the mean daily temperature was almost constantly within the range favorable for rust development. At Dallas, where the rust did not overwinter in the experimental plots, the temperature was not favorable for rust development during December, January, February and early March.

Graphs were constructed in an attempt to correlate differences in rust development with weather conditions at several points in Minnesota, North Dakota and South Dakota. At these places, however, variation in the rapidity of rust development seemed to be due to the severity of the initial infection rather than to differences in weather conditions.

An attempt was made to correlate the distribution and precipitation of spores caught on glass slides with the occurrence of low or high pressure areas on the daily weather maps. No definite conclusions could be reached in this way. A knowledge of the biologic forms involved and the distribution of these forms early in the season might add to the possibilities of this mode of attack. The transportation of dust[1], on March 29, 1924, which apparently rose in Texas, Oklahoma and Arkansas, and was precipitating in Nebraska, Iowa, Minnesota, Illinois, Missouri, Indiana and Michigan furnished an excellent illustration of the probable mechanism by which spores are raised, transported, and deposited.

During the last week in April, two balloons made continuous nonstop flights from San Antonio, Texas, to the spring wheat area. One of the balloons landed at Rochester, Minnesota, after forty-four hours of flight. The other landed in northern Iowa. These flights suggest that spores may be carried long distances by the wind in a few hours.

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1 See Monthly Weather Review, March, 1924, page 141.

Discussion and Conclusions

The evidence already presented indicates clearly that two sources of inoculum might have been responsible for the epidemics of stem rust on wheat and oats, viz: (1) spores produced as a result of overwintering of the uredinial state in southern Texas; and (2) infection on barberries in the eradication area. The principal objects of the field studies were to determine the relative importance of these sources of inoculum and to determine the probability of other sources of inoculum contributing to the epidemic. Obviously the solution of these problems varies in different regions, with different hosts and with different rusts.

In the eastern part of the barberry eradication area all of the severe stem rust seemed to result from barberry infection. On the other hand, the epidemic in parts of the hard red spring wheat area could not be traced directly to barberry infection. Circumstantial evidence indicates that part of the epidemic in this region may have been due to wind blown spores from States farther south. There was no indication of overwintering in this region. In Missouri, Kansas and Oklahoma, a limited number of observations indicated that barberries played very little part in the production of the epidemic. There was no evidence of overwintering in these States. Early infection in northern Texas appeared to result from spores blown north from southern Texas or possibly Mexico. In southern Texas, stem rust undoubtedly overwintered on wheat and oats. Part of the early spring infection in this region may have been due to wind blown spores from Mexico, although it is difficult to understand how stem rust can spread from Mexico to Texas without stripe rust spreading also.

From the above discussion it is evident that we need more direct evidence of the spread of rust from one area to another, further knowledge of the importance of barberry infection especially in Kansas and Missouri, more experimental evidence on the effect of host development and of weather on rust development and distribution. Future work will be directed along these lines.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 February 15, 1925 No. 3
Personnel (Feb.1-15) and Field Station (Jan.16-31) Issue

PERSONNEL ITEMS

Merle T. Jenkins, assistant agronomist in the corn breeding project conducted at Ames, Ia., in cooperation with the Iowa Agricultural Experiment Station, left Washington February 1 to return to his headquarters at Ames, Ia.

Schuyler F. Kollar, of Woodward, Okla., was appointed February 2 unskilled laborer to assist in the cooperative cereal experiments at the Kansas Agricultural Experiment Station, Manhattan, Kans., under the direction of John H. Parker. He succeeds John E. Norton, who resigned January 31 to become county agent of Meade County, Kansas.

Miss Addie E. Pieh, assistant in histological studies of the scab disease of wheat conducted cooperatively at Madison, Wis., by the Office of Cereal Investigations and the Wisconsin Agricultural Experiment Station, resigned her position on January 31 to accept an appointment in the botany department of the University of Wisconsin.

Miss Grace O. Wineland, assistant pathologist in the investigations of wheat scab and related diseases of corn, conducted cooperatively by the Office of Cereal Investigations and the Wisconsin Agricultural Experiment Station, at Madison, Wis., resigned her position at the end of January 31, 1925.

VISITORS

Recent visitors in the Office were Harold M. Ware and Horace W. Truesdell, two young Americans connected with the Russian Reconstruction Farms, Inc., an educational project intended to modernize Russia's farming system. Mr. Ware, a graduate of the Pennsylvania State College of Agriculture and a practical farmer,

for more than three years has demonstrated to the Russian peasantry that American farm machinery and American methods of farming can solve Russia's agricultural problems. Mr. Truesdell, who is president of the Russian Reconstruction Farms, Inc., with headquarters at 70 - 5th Ave., New York, N. Y., was formerly a member of the staff of the Bureau of Plant Industry, of the U. S. Department of Agriculture.

Mr. Ware will return to Russia this month with a further consignment of agricultural machinery, farm seeds, etc.

MANUSCRIPTS AND PUBLICATIONS

12* A manuscript, entitled "Biannual Cropping of Wheat Hybrids," by V. H. Florell, was approved February 4, for publication in the Journal of the American Society of Agronomy.

13 A manuscript, entitled "The Germination of Barley under Late Spring Malting Conditions in India," by Harry V. Harlan, was approved February 7 for publication in Science.

14 A manuscript, entitled "A Specific Gravity Gradient in the Juice of Corn Stalks," by A. M. Hurd-Karrer, was approved February 7 for publication in Science.

Page proof of Department Bulletin 1321, entitled "A Statistical Study of the Relation between Seed Ear Characters and Productiveness in Corn," by Frederick D. Richey and J. G. Willier, was read February 9.

Page proof of Department Bulletin 1316, entitled "Some Effects of Sodium Arsenite when Used to Kill the Common Barberry," by E. R. Schulz and Noel F. Thompson, was read February 9.

Page proof of Paper, entitled "A Study of Variability in the Burt Oat," by Franklin A. Coffman, John H. Parker, and Karl S. Quisenberry, for publication in the Journal of Agricultural Research, was read February 13.

The paper, entitled "A Method of Increasing the Efficiency of Filter Cylinders," by H. H. McKinney, was published in Phytopathology, v. 14, no. 12, p. 585-586. December, 1924. (Received January, 1925.)

The report, entitled "Progress of Barberry Eradication in Colorado," by E. A. Lungren, has been published in the Annual Report of the State Entomologist of Colorado, v. 15, p. 15-17. June, 1924. (Received January, 1925.)

The paper, entitled "Stripe Rust (Puccinia glumarum) of Cereals and Grasses in the United States," by H. B. Humphrey, C. W. Hungerford and A. G. Johnson, appears in the Journal of Agricultural Research, v. 29, no. 5, p. 209-227, 1 pl. (col.), 5 fig. September 1, 1924. (Received from the Government Printing Office February 7, 1925.)

*Manuscripts submitted during the calendar year 1925 are numbered in chronological order.

Through inadvertence the third entry in the Cereal Courier of January 31, 1925, (vol. 17; no. 2, p. 10) was given only one number; as three separate manuscripts were included the entry should have been numbered 7-9, inclusive. The first manuscript in this number of the Courier therefore is numbered 12.

The paper, entitled "Studies on the Inheritance of Earliness in Wheat," by Victor H. Florell, appears in the Journal of Agricultural Research, v. 29, no. 7, p. 333-347, 5 fig. October 1, 1924. (Received from the Government Printing Office February 7, 1925.)

The paper, entitled "Infection of Barley by Ustilago nuda through Seed Inoculation," by W. H. Tisdale and V. F. Tapke, appears in the Journal of Agricultural Research, v. 29, no. 6, p. 263-284, 9 pl. September 15, 1924. (Received February 2, 1925.)

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (No report)

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (H. H. Love) (February 7)

There has been sufficient snow recently so that the wheat nursery is well covered. On January 29 a snowfall of over two feet resulted in tying up the local traffic for a few days. If the snow does not go off too rapidly the moisture will not interfere with the wheat nursery.

A large plant breeding exhibit is now being installed for Farmers' Week which begins February 9. This will feature the various varieties of cereals as well as the other lines of work we are following.

In connection with our Better Seed Program, samples of the various small grains have been sent into the laboratory for examination. The lists of those growers having seed that will pass for certification is now being prepared for distribution. We do not have the final figures on the available quantity, but apparently there will be sufficient quantities of Cornellian oats and Alpha barley. Unfortunately many fields of the latter were badly smutted.

In the oat nursery for 1924 there were a large number of hybrids between Cornellian and certain other varieties. As a means of furnishing information to aid in intelligent discarding, the weight per bushel and the per cent of meat were obtained; considerable variation was found in these characters.

Data are being collected now from the hull-less hybrids which were grown in the hybrid nursery.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

Agricultural Experiment Station, Baton Rouge (H. Stenceberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (No report)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (February 2)

The State leader attended the annual meeting of State leaders at University Farm, St. Paul, Minn., from January 12 to 16.

In January a mailing list was compiled of the rural-box holders in 23 counties of Illinois. About 350 letters were mailed to postmasters and more than 56,000 boxes have been listed. It is planned to send out form letters to the farmers in these counties a few days before the field men start the original survey next summer.

Considerable time was spent in checking the survey records by counties in an effort to get all the records and reports to agree.

Many men have applied for positions as field assistants. Plans are being made to select the men as soon as possible and get the field force organized.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, C. A. Aamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (No report)

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (January 15)

The yields and other data from the varietal experiments with grain and forage sorghums at this station have been compiled. The method of conducting the experiment differed from that used in former years.

In the first place, the sorghum projects of the Offices of Cereal Investigations and Forage-Crop Investigations were combined, which made it possible to conduct a larger experiment with more efficiency and less duplication. In the second place, all the varieties were planted on three different dates but within a normal seeding period so that all selections would have a chance to mature. The final yield of any variety is the average of the yields from the three different dates of planting, namely, May 14, June 5, and June 12.

Variety	Yield (Bu.per A.) May 14	Yield (Bu.per A.) June 5	Yield (Bu.per A.) June 12	Av. Yield (Bu.perA. three dates
Feterita and Derivatives				
Feterita C. I. 182-1	39.3	33.8	41.3	38.1
Feterita S. P. I. 22329	32.7	40.1	43.4	38.7
Spur feterita	30.0	33.0	49.5	37.5
Dwarf feterita F. C. I. 9076	11.8	49.6	51.7	37.7
Dwarf feterita F. C. I. 6603	22.4	46.6	54.1	41.0
Chiltex	16.0	51.2	47.7	38.3
Premo	31.0	46.1	38.7	38.6
Kafir x milo x feterita	29.4	41.8	39.6	36.9
Red Amber x feterita	30.7	43.0	43.7	39.1
Red Amber x feterita	42.9	28.1	17.3	29.4
Red Amber x feterita	40.1	25.9	30.2	32.1
Kaferita	26.8	24.6	18.2	23.2
Freed Sorgo and Derivatives				
Freed	26.5	21.8	21.2	23.2
Pink Freed (P. Kafir x Freed)	37.7	32.1	31.6	33.8
Dwarf Pink Freed	18.6	24.8	22.8	22.1
Weskan	40.7	43.2	50.3	44.7
Kafirs Other Than Blackhull				
Early Pink	36.7	31.0	35.3	34.3
Pink C. I. 432	15.5	38.8	30.6	28.3
Pink F. C. I. 9091	41.6	43.2	50.4	45.1
Red kafir	26.6	39.5	35.4	33.8
Blackhull Kafirs				
Dawn	36.1	47.9	51.6	45.2
Western	36.6	58.7	43.7	46.3
Standard Blackhull F. C. I. 9119	14.7	0	0	4.9
Standard Blackhull C. I. 71	19.6	35.4	0	18.3
Reed kafir	32.5	49.6	46.3	42.8
Sunrise	24.1	36.3	43.5	34.6
Standard Blackhull C. I. 204	29.8	56.4	38.0	41.4
Milo Group				
Dwarf Yellow C. I. 332	31.0	53.9	35.8	40.2
Dwarf Yellow F. C. I. 8913	26.3	46.1	33.6	35.3
Standard Yellow C. I. 234	35.0	25.9	33.8	31.6
Dwarf White F. C. I. 8927	24.6	36.2	32.5	31.1
Standard White C. I. 352	20.6	25.8	28.6	25.0
Early White C. I. 480	39.6	47.4	34.8	40.6
Forage Sorghum Group				
Black Amber	36.7	30.4	30.1	32.4
Red Amber	23.1	20.8	24.3	22.7
Colman	31.8	28.1	44.6	34.8
Leoti Red	36.4	27.9	43.8	36.0
Western Orange	47.8	31.4	51.0	43.4
Kansas Orange	26.1	10.5	0	12.2
Kansas Orange	33.1	.8	0	11.3

Variety	Yield (Bu.per A.) May 14	Yield (Bu.per A.) June 5	Yield (Bu.per A.) June 12	Av.Yield (Bu.perA three Dates
Forage Sorghum Group (cont'd)				
Sourless x kafir	13.9	25.2	0	13.0
Sourless x kafir	32.8	3.0	0	11.9
Sourless x kafir	22.7	0	0	7.6
Sourless x kafir	25.9	20.9	13.5	20.1
Sourless x kafir	37.5	32.7	0	23.4
Sourless x kafir	36.5	27.8	0	21.4
Sourless x kafir	31.1	40.5	38.9	36.8
Sourless x kafir	30.6	37.0	39.8	35.8
Sourless	29.3	6.8	0	12.0
African	1.8	0	0	.6
Honey	0	0	0	0
Honey	0	0	0	0
Sapling	0.8	0	0	0.3
Sorgo	0	0	0	0
Sorgo	0	0	0	0
White African	0	0	0	0
Early Sumac	33.4	30.5	40.2	34.7
Dakota Amber X Sumac	37.2	35.2	34.1	35.5
Sumac	0	0	0	0
Sumac	10.0	2.3	0	4.1
Miscellaneous Sorghum Group				
Schrock	33.4	20.9	20.0	24.8
Darso	48.8	39.4	36.4	41.5
Dwarf hegari	35.8	11.9	0	15.9
Dwarf hegari	13.5	0	0	4.5
Corn (as check)	1.8	11.6	26.8	13.4

The plats for each date of seeding received the cultivation that was necessary to produce the best results.

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (No report)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Pulger) (No report)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (January 16)

Cold weather has prevailed here since about the middle of December, the mean temperature being considerably below normal for that time. The mean temperature for December was 5.90 degrees, which was more than 11 degrees below normal. The minimum temperature for December was 35 degrees below zero on the 18th. This low December temperature has been reached only once before in the history of the Substation. The snow is about 6 inches deep, giving fairly good snow protection to the winter grain.

The precipitation for the year 1924 was 15.20 inches, which is a very little below normal. The precipitation during the growing season also was slightly below normal. In spite of this fact the grain yields for 1924 were unusually good, probably because of the abundant rainfall in the preceding fall and the low summer temperature which reduced loss of soil moisture through evaporation.

On the occasion of a recent unofficial trip to Missouri the writer stopped en route at the University Farm at St. Paul, Minn., and the Agricultural College at Fargo, and talked with officials in charge of experiments with cereal crops at both places.

(January 31)

The weather of the first half of January was colder than usual but that of the latter half was mild enough to offset the cold weather, so that the mean temperature for the month, 11.2 degrees, was 0.8 degree above normal. There were 15 days when the minimum was below zero, the minimum for the month being 27 degrees below zero on the 14th, and the maximum, 41 degrees above zero on the 21st.

About five inches of snow fell during the month, making a precipitation of about 0.50 of an inch, which is slightly above normal. The snow is now about five or six inches deep on a level. Winter wheat in both plats and nursery has been protected by snow since early in December. That portion of the winter-wheat nursery on fallow has been bare for the past week.

The annual report of cereal work at the Substation for 1924 is nearly finished, with the exception of the weather data.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (No report)

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (No report)

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (No report)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell) (No report)

Agricultural Experiment Station, Berkeley (F. N. Briggs) (No report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 4

February 28, 1925
Personnel (Feb.16-28) and Project Issue

PERSONNEL ITEMS

Miss Frances M. Hanson, of Boone, Ia., was appointed clerk, effective February 16, to assist Marion A. Smith, State leader of barberry eradication in Iowa, with headquarters at Ames.

C. S. Reddy, associate pathologist in charge of bacterial diseases of cereals, gave a talk on Bacterial Blight of Barley and Related Diseases at the 37th meeting of the Washington Branch of the Society of American Bacteriologists, Tuesday evening, February 24.

VISITORS

Mr. Homère N. Racicot, plant pathologist of the Provincial Experimental Station, Ste. Anne de la Pocatière, Quebec, visited the Office the last week of February, having been authorized by the Canadian Government to confer with pathologists of the U. S. Department of Agriculture, particularly those of the Office of Cotton, Truck and Forage-Crop Disease Investigations and the Office of Cereal Investigations. Mr. Racicot is especially interested in mosaic diseases of potatoes, beans, and other crops.

R. S. Kirby, assistant pathologist in this Office from August, 1918, to June, 1920, and now extension pathologist at the Pennsylvania State College of Agriculture, was an Office visitor February 24 and 25.

Señor M. Zavala, of the Nicaraguan Legation in Washington recently conferred with specialists of this Office concerning varieties of cereals that may be adapted to the conditions of Nicaragua.

MANUSCRIPTS AND PUBLICATIONS

15* A manuscript, entitled "The Progress of Barberry Eradication in Colorado, 1924," by E. A. Lungren, was submitted February 12 for publication in the Annual Report of the State Entomologist of Colorado.

16 A mansucript, entitled "The Inheritance of Disease Resistance in Wheat and Oats," by E. F. Gaines, was approved February 21 for publication in Phytopathology.

17 A manuscript, entitled "The Productiveness of Strains Selected from a Variety of Corn and of Crosses between Them," by Frederick D. Richey and H. S. Garrison, was submitted February 24 for publication as a Department Bulletin.

18 A manuscript, entitled "The Pasmo Disease of Flax," by W. E. Brentzel, was approved February 26 for publication in the Journal of Agricultural Research.

19 A manuscript, entitled "Why Agronomy Needs Research in Plant Physiology," by C. R. Ball, was approved February 27, 1925, for publication in the Journal of American Society of Agronomy.

20 A manuscript, entitled "Experiments with Corn on Dry Land in Colorado," by F. A. Coffman, was approved February 27 for publication as a cooperative bulletin of the Colorado Agricultural Experiment Station.

The manuscript, entitled "Certain Footrot Diseases of Wheat in America," by H. H. McKinney, which was submitted December 26, 1924, for publication in the Journal of Agricultural Research, was resubmitted February 17, 1925, for publication as a Department Bulletin.

Page proof of Department Bulletin 1287, entitled "Experiments with Cereals at the Akron (Colo.) Field Station," by F. A. Coffman, was read February 28.

Second page proof of Department Bulletin 1309, entitled "Experiments with Small Grains on the Arlington Experiment Farm," by John W. Taylor, was read February 25.

Second page proof of Department Bulletin 1321, entitled "A Statistical Study of the Relation between Seed Ear Characters and Productiveness in Corn," by Frederick D. Richey and J. G. Willier, was read February 19; third page proof read February 27.

*Manuscripts submitted since January 1, 1925, are numbered in chronological order.

Department Circular 341, entitled "Seed Flax as a Farm Crop in 1925," by A. C. Dillman, A. C. Arny, Clyde McKee, T. E. Stoa, and A. N. Hume, was received from the Government Printing Office February 17.

Department Bulletin 1276, entitled "Varietal Experiments with Hard Red Winter Wheats in the Dry Areas of the Western United States," by J. Allen Clark and John H. Martin was received from the Government Printing Office February 19, bearing date of February 12, 1925.

The paper, entitled "Some Cases of Apparent Fertilization in Barley," by Harry V. Harlan and Merritt N. Pope, appears in the Americal Journal of Botany, v. XII, no. 1, p. 50-53, pl. VI. January, 1925. (Received February 19, 1925.)

TRANSLATION

Åkerman, Å. Sommarens gulrostangrepp på vetet. (Attacks of yellow rust upon wheat during the summer.) Sveriges Utsädesför. Tidskr. 33: 262-267. 1923.

Beauverie, J. Échelle de sensibilité des blés à la rouille jaune (Puccinia glumarum) in 1923. (Scale of susceptibility of wheats to yellow rust Puccinia glumarum in 1923.) Rev. Path. Vég.and Entom. Agr. 11: 26-28. 1924.

_____ Notes pour l'etude internationale des rouilles du blé. (Notes for the international study of rusts of wheat.) Rev. Path. Vég. and Entom. Agr. 11: 29-31. 1924.

Daikuhara, G. Ueber saure mineralböden. (On acid mineral-soils.) Imp. Centr. Agr. Stat. Japan Bull. 2: 1-40. 1914.

Eriksson, J. Betningsförsök med uspulun och supersolfo sasom kampmedel emot stinksot å vete. (Experiments with uspulun and supersolfo against stinking smut in wheat.) K. Landtbr.-akad. Handl. o. Tidskr. 61: 607-610. 1922.

_____ Om uppkomst och spridning af sädesrost ur och genom utsädeskorn. (On the origin and dispersal of cereal rusts by means of the seed.) Meddel. K. Landtbr.-akad. Experimentalfält no. 72. 51 p. 1902.

Fabricius, J. C. Forsög til en Afhandling om planternes sygdomme. (A paper on plant diseases.) K. Norske Vidensk. Selsk. Skrift. 5: 431-492. 1774.

Foëx, Et. Quelques observations sur les conditions qui favorisent le développment et l'extension des rouilles des céréales. (Some observations on the conditions which favor the development and the spread of the rusts of cereals.) Rev. Path. Vég. and Entom. Agr. 11: 32-41. Ja.-Mr. 1924.

Gassner, G., and Esdorn, I. Beiträge zur frage der chemotherapeutischen bewertung von quecksilberverbindungen als beizmittel gegen Weizensteinbrand. (Contributions to the question of the chemotherapeutic value of mercury-salts as fungicides against bunt or stinking smut of wheat.) Arb. Biol. Reichsanst. Land. u. Forstw. 11: 373-385. 1923.

Gleisberg, W. Saatgutbeizung und stimulierung. (On the treatment and stimulation of seed.) Illus. Landw. Ztg. 43: 191-192. 1923.

Henning, E. Om betning mot stinkbrand (Tilletia tritici) stråbrand (Urocystis occulta) och hardbrand (Ustilago hordei). II. Bitrag til formalinbetningens teknik. (Treatment against Tilletia tritici, Urocysti occulta, and Ustilago hordei. II. A contribution to the technique of the treatment with formalin.) Meddel. No. 231 Centralanst. Försöksv. Jordbr. Avdeln. Landtbruksbot. no. 24. 1922.

Klebahn, H. Ein beitrag zur getreideroststrage. (A contribution to the problem of cereal rusts.) Ztschr. Pflanzenkr. 8: 321-342. 1898.

Nilsson, G. Några undersökningar rörande olika betningsmedels inverkan på skjutkraften hos havre. (Experiments with various fungicides to test their influence upon the sprouting power of oats.) Sveriges Utsädesför. Tidskr. 33: 276-285. 1923.

Tischler, G. Untersuchungen über die beeinflussung der Euphorbia cyparissias durch Uromyces pisi. (Investigations on the influence of Uromyces pisi upon Euphorbia cyparissias.) Flora 104: 1-64. 1911.

The above list of translations of foreign articles on Cereal diseases supplements the lists found in the Cereal Courier as follows:

Vol. 13: 12-15, 52, 69 and 225-226;

Vol. 14: 38, 39 and 99-100;

Vol. 15: 11-13 and 46-47;

Vol. 16: 16-18 and 127.

The translations are available in the library of the Bureau of Plant Industry.

PROJECT REPORTS

WESTERN WHEAT INVESTIGATIONS

(J. Allen Clark, Agronomist in Charge, and John H. Martin, Associate Agronomist)

Announcement is here made of new names applied to four wheat varieties.

Newturk, C. I. No. 6935

This is an awnless variety of hard red winter wheat bred from a Newton-Turkey cross made at Moro, Oreg., in 1916. Newton (C. I. No. 5300) is an awnless selection of Alton made at Newell, S. Dak., in 1908. The cross was one of several made to develop an awnless, high yielding, hard red winter wheat. In 1919, 165 awnless F_3 selections made at Chico, Calif., from three of the crosses were sent to Moccasin, Mont. The above, previously known as 166 B 1-6, has proved the best of these in five years' experiments. The yield data in comparison with the parents and Karmont and Kanred, the leading winter wheats at Moccasin, are as follows:

VARIETY	1920	1921	1922	1923	1924	Average
Nursery						
Newturk	46.9	27.3	43.5	37.4	38.8	38.8
Newton (parent)	33.5	22.1	38.0	37.2	37.8	33.7
Turkey (parent)	38.9	31.0	37.6	39.1	39.5	37.2
Plats						
Newturk			42.1[a]	33.7	40.9	38.9
Karmont			35.0	34.6	39.1	36.2
Kanred			35.4	32.1	40.9	36.1

[a] Single plat.

Milling and baking experiments indicate that Newturk is about equal to the standard hard red winter varieties.

Mondak, C. I. No. 7287

This is a selection of Kubanka, C. I. No. 1449, made at the Dickinson (N. Dak.) Substation in 1914. It has been known as Kubanka No. 74. In nursery experiments at Dickinson it proved the second highest yielding of 143 Kubanka selections from 1917 to 1922. It entered the plat experiments in 1920 and later was increased with Nodak (Kubanka No. 98) for commercial growing because of its good yields and high gasoline color score. It has proved superior to both Nodak and Kubanka in color of its flour or semolina.

As it is susceptible to stem rust it is not adapted to eastern North Dakota and is now grown commercially only in the vicinity of the Dickinson Substation. It has been in plat experiments at Moccasin, Mont., since 1922. The yield data from that station in comparison with Kubanka, Nodak, and Peliss are as follows:

Variety	1922	1923	1924	Average
Mondak	30.7	28.2	26.3	28.4
Kubanka	24.8	25.6	27.7	26.0
Nodak	26.5	25.7	23.2	25.1
Peliss	27.5	22.7	24.9	25.0

The name Mondak indicates its origin in Montana and North Dakota, where it has proved well adapted in the sections not affected by stem rust. As this disease is not a factor in Montana, Mondak should be preferred to Kubanka and Peliss, the leading commercial durum varieties of that State.

Akrona, C. I. No. 6881

This is an early, heavy stooling selection of Arnautka (C. I. No. 1493) made at the Akron Field Station, Akron, Colo., in 1912. It had a favorable record in the nursery and was entered in the plat experiments in 1920. During the four years 1920 to 1923, inclusive, it was the highest yielding durum variety at Akron, outyielding Kubanka on the average by about two bushels per acre. In 1924 durum varieties were not harvested at Akron because of failure from drought. The Akrona variety, however, had been included in plat experiments at other stations. Milling and baking experiments, including the gasoline color tests, indicate that the variety has an exceptionally high color and other desirable qualities. The yield and gasoline color data are as follows:

Station and year		Yield (bushels)		Gasoline color	
		Akrona	Kubanka	Akrona	Kubanka
Akron, Colo.	1920	20.4	17.1		
	1921	10.2	8.6		
	1922	10.2	9.6	2.18	1.32
	1923	17.2	15.0	2.10	1.32
Average		14.5	12.6	2.14	1.32
Hays, Kans.	1924	15.4	9.2	2.35	
North Platte, Nebr.	1924	11.1	14.5	2.29	1.31
Dickinson, N. Dak.	1924	21.7	20.0	2.42	1.74
Moccasin, Mont.	1924	29.9	27.7	2.26	1.75

The name Akrona indicates its origin. It is being increased at the Akron Field Station for commercial distribution in that section.

Webster, C. I. No. 3780

This variety was introduced in 1912 with 80 other wheats from the Turkestan section of Russia. They were sent to the U. S. Department of Agriculture by the Bureau of Applied Botany from St. Petersburg (Petrograd). The collection was first grown at Highmore, S. Dak., and Moccasin, Mont., in 1914. At Archer, Wyo., in 1916, C. I. No. 3780 had no rust when other varieties rusted as high as 35 per cent. In the cereal rust nursery at St. Paul, Minn., however, it rusted from 20 to 70 per cent during the three years, 1915 to 1917, inclusive. At the Highmore, S. Dak., Substation, from 1917 to 1919, it was resistant and produced the best yields of the original collection and of all other varieties. It also had yielded well at Archer but only fair at Moccasin. Because of the resistance and high yield at Highmore the variety here named Webster (C. I. No. 3780) has been used for crossing with Kota and other varieties by Mr. E. S. McFadden at Webster, S. Dak. Because of his success with these crosses the Webster variety recently has been tested and has shown resistance to several forms of stem rust in greenhouse experiments at St. Paul, Minn. It also has been found resistant to leaf rust by Mr. McFadden and in greenhouse experiments at Lafayette, Ind.

The Webster variety has awned, lax, fusiform spikes, glabrous, white, firm glumes and long, slender hard red kernels. In many respects it is spelt-like or a "speltoid." Because of this the variety is not likely to be of commercial value; but it is here named, since it is being used in breeding for rust resistance.

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BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 5

March 15, 1925
Personnel (March 1-15) and Field Station (Feb. 1-28) Issue.

DATE OF ISSUANCE OF CEREAL COURIER

Beginning with the issue of April 10, the Cereal Courier will again appear three times a month, namely, on the 10th, 20th, and last days of the month. It will be greatly appreciated if, beginning April 1, until further notice, all contributors at agronomic and pathologic field stations will mail reports promptly on the 15th and last days of the month. The Project Issue of the Cereal Courier is dated on the last day of each month.

PERSONNEL ITEMS

C. W. Hungerford, professor of plant pathology in the College of Agriculture and plant pathologist of the agricultural experiment station of the State of Idaho, and agent in the stripe-rust investigations conducted in cooperation with the Office of Cereal Investigations, has been awarded the degree of Doctor of Philosophy by the University of Wisconsin.

VISITORS

Prof. Josef Mikulowski-Pomorski, professor of agricultural chemistry, Principal School of Rural Economy, Warsaw, Poland, was an Office visitor March 11. He has asked that the Principal School of Rural Economy (Szkola glo'wna gospod wiejskiego), Warsaw, Poland, be supplied with certain varieties of corn that are likely to be adapted to the region of Warsaw.

James Godkin, extension pathologist of the Virginia Agricultural Experiment Station, Blacksburg, Va., formerly assistant pathologist in this Office, was a visitor on March 3 and conferred with specialists of the Office concerning the eradication of Berberis canadensis as a preventive of the spread of black stem rust in southwestern Virginia.

MANUSCRIPTS AND PUBLICATIONS

21* A manuscript, entitled "Personnel, Personalities, and Research," by Carleton R. Ball, was approved March 9 for publication in the Scientific Monthly.

22 A manuscript, entitled "Kill the Common Barberry with Salt and Kerosene," by F. E. Kempton and Noel F. Thompson, was submitted March 10 for publication as a Department Circular.

23 A manuscript, entitled "Chemical Composition of Etiolated and Green Barberry Sprouts and Their Respective Roots," by E. R. Schulz and Noel F. Thompson, was submitted March 13 for publication in the Journal of Agricultural Research.

Galley proof of paper, entitled "Study of the Life History and Ecologic Relations of the Smut of Maize," by Alden A. Potter and Leo E. Melchers, for publication in the Journal of Agricultural Research, was read March 11.

An article, entitled "Sowing the Flax-Wheat Mixture," by A. C. Dillman, appears in The Dakota Farmer, v. 35, no. 5, p. 230-231. March 1, 1925.

Bulletin No. 183, of the Washington Agricultural Experiment Station, entitled "The Principles of Summer-Fallow Tillage," by M. A. McCall and H. M. Wanser, was received March 10, bearing date of October, 1924. ("The experiments upon which this bulletin is based were conducted cooperatively by the Washington Agricultural Experiment Station and the Office of Cereal Investigations, Bureau of Plant Industry, U. S. Department of Agriculture, until September 30, 1920. Since that date they have been conducted by the Washington Agricultural Experiment Station.")

The paper, entitled "Carbohydrate Storage in the Endosperm of Sweet Corn," by Lois Lampe and Marion T. Meyers, has been published in Science, n. s., v. 61, no. 1576, p. 290-291. March 13, 1925. ("Departments of Botany and Farm Crops of the Ohio State University, and the Office of Cereal Investigations, Bureau of Plant Industry, U. S. Department of Agriculture, cooperating.")

CORRECTION

The paper by Harry V. Harlan and Merritt N. Pope, appearing in the American Journal of Botany 12: 50-53, January, 1925, was incorrectly cited in the Cereal Courier of February 28. The title should read: "Some Cases of Apparent Single Fertilization in Barley."

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*Manuscripts submitted are numbered in chronological order.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (March 12)

Considerable winterkilling or injury has occurred in winter oats and barley. The weather in January was severe so far as low temperatures are concerned, but fortunately the grain crops were well protected by snow. Oats, especially Kanota, several Fulghum types, and many nursery selections with spring habit of growth were severely injured or entirely killed. Barley apparently survived the low temperatures of January, but suffered in February when after several days of 60° F. the temperature dropped to 16° F. Wheat and rye are now in excellent condition.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (H. H. Love) (No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (No report)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (No report)

INDIANA

Purdue University Agricultural Experiment Station, LaFayette (Corn Root, Stalk, and Ear Rots, G. M. Hoffer) (No report)

Purdue University Agricultural Experiment Station, LaFayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, LaFayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (Scuth to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (No report)

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (No report)

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (March 12)

During the winter months an extensive educational campaign has been in progress in the agricultural schools in Colorado and Wyoming. Packets of materials and lesson plans have been sent out from this office to the agricultural instructors.

On March 12 the State leader followed up one of the leads sent in by Mr. E. Hinds of the Eaton High School at Eaton, Colo. Specimens of common barberry were brought to the attention of Mr. Hinds by one of the school boys the day following the lecture and laboratory course. Forty-six plants of common barberries and four escaped bushes were found on this property.

The renter of the property had cut off the bushes at the crown in the early part of our survey of 1921, and because of this they were missed on the original survey. The educational work brought these sprouting bushes to light. Examples of this kind may be numerous, and thus it is necessary that every student become familiar with the common barberry bush.

The field operations this spring will consist of second survey for common barberries and early rust surveys to trace any missed bushes.

We are also planning a cooperative project for early rust surveys through the agricultural agents, Smith-Hughes teachers, and others familiar with pathology.

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (No report)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) (No report)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (March 2)

The weather in February was comparatively mild, the mean temperature for the month being 20.6 degrees, which is 8.8 degrees above normal. There has been almost no snow on the ground since the middle of the month and only 0.17 of an inch of precipitation in the entire month.

During the period of severely cold weather in December and January the winter grain was well protected by snow so that it should not be seriously injured by the winter up to this time.

At a farmers' meeting held in Dickinson on February 28 talks on agricultural subjects were made by Dr. W. J. Spillman of the Bureau of Agricultural Economics, U. S. Department of Agriculture, Rex Willard of the North Dakota Agricultural Experiment Station, and others.

Supt. Mocmaw of the substation is expected to return from Washington this week.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (No report)

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (No report)

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (No report)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (February 20)

The winter-wheat situation in eastern Oregon is unchanged. It is certain that there will be in the neighborhood of 400,000 acres to reseed. Because of scarcity of seed farmers are using about any variety they can obtain. Several carloads of Bunyip have been shipped into eastern Oregon for reseeding. There has been a keen demand for both Hard Federation and Federation and two or three times as much more could have been used than was available. County agent Bennion states that there will be sown in Umatilla county this spring 75,000 acres of Federation and 25,000 acres of Hard Federation. The highest price paid for these varieties was $3.05 a bushel delivered at Moro. Most of the Hard Federation and Federation sold from $2.70 to $2.80 a bushel.

Notes on winterkilling of several winter-wheat varieties sown in a nursery near Dufur in Wasco county may be interesting. County agent Daigh and I made careful estimates of winterkilling in each of three series of three rod-row plats grown in this nursery. I am inclosing a table showing the average percentage of winterkilling in the three series.

Notes on winterkilling in nursery near Dufur, Oregon.

2/13/25

Variety	Per cent winterkilling
Crimean 889-5	7
Argentine 1569-2	8
Kharkov 1442-12	9
Turkey (151C P) 7364	10
Kanred 5146	10
Crimean Sel. (3055A) 7366	11
Ridit 6703	13
Turkey x Florence G326W-1	13
" " " G326W-3	13
Sherman 4430	15
Hussar 4843	16
Triplet Br. Gl. Sel. No. 4	17
Blackhull 6251	18
Turkey x Florence G326W-8	18
Triplet 5408	18
Mosida 6688	19
Fortyfold 4136	29
Kanred x Marquis 1718B2-4-5	30
Hybrid 128	36
Hybrid No. 128 x Fortyfold 1998A3-1	38
" " " " 1998A4-3	40
" " " " 1998A1-1	42
P1068 x Preston, Kans. 634	47
P1068 x Preston, Kans. 5914-26-3	50
Hybrid 63	52
White Odessa 4655	55
P1068 x Preston, Kans. 5896-3-6	62
Fortyfold x Hard Federation 1995A1-1	72
Hybrid 143	78
Early Arcadia x Hard Fed. 1992A3-5-4	78
Fortyfold x Federation 1993A2-13	88
" " " 1993A2	94
Jenkin	98
Bluestem 4067	100
Federation 4734	100

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (March 2) (From Berkeley)

The writer made a trip to Biggs on February 19, returning February 23.

The rainfall at Biggs in February was considerably above normal; however, floods in the Valley were prevented by turning the water into the by-pass along the Sacramento River. Fall-sown grain and pasture crops look well, though early-sown grain may be making too much growth for best results.

The snowfall in the mountains is considerably heavier than for the past two or three years; this should insure a good supply of irrigation water for next summer.

It is estimated that there probably will be an increase of 30 to 40 per cent in the rice acreage this year. Under the Sutter Butte Canal, however, the acreage probably will be materially reduced.

We are having the Station buildings painted and they surely need it.

On February 20, at a meeting called by the County Agent of Glenn County, the writer reported briefly upon the results of our rice experiments at Biggs. There was a fair attendance. It is expected that there will be a marked increase in the rice acreage of Glenn County this year.

University Farm, Davis (V. H. Florell) (February 28) (From Berkeley)

The heaviest rains of the season began early in February and extended over most of the month. The Sacramento River was in flood stage for several weeks and to save the lowlands from serious damage the flood waters were diverted into the by-passes which have been constructed for just such emergencies. The rainfall in this part of the State is now above normal, but in southern California there is still a considerable shortage.

A week ago today the writer visited Davis and found the cereal experiments in good condition and making rapid growth. Barleys were from 8 to 12 inches high. Wheat and oats were not so far along but they also are making vigorous growth.

The weather in the latter part of January was very favorable for the sowing of winter grain and most growers took advantage of it. However, a small acreage of grain, principally barley, is now being sown on the lowlands along the Sacramento River. It is reported that a limited acreage of barley on the flooded lowlands were damaged, making reseeding necessary.

Agricultural Experiment Station, Berkeley (F. N. Briggs) (No report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 6

March 31, 1925
Personnel (Mar.16-31) and Project Issue

PERSONNEL ITEMS

Dr. C. R. Ball, senior agronomist in charge of the Office of Cereal Investigations, has been authorized to attend the special convention of Experiment Station Directors in St. Louis April 20 and 21, and to present a paper on "Some Elements of Successful Cooperation in Research."

Charles E. Chambliss, associate agronomist in charge of rice investigations, left Washington March 28 for a five weeks' trip in North Carolina, South Carolina, Georgia, Alabama, Louisiana, Tennessee, and Virginia in the interests of rice investigations. He will confer with officials of State agricultural experiment stations, seedsmen, and others interested in rice and also will inspect the cooperative experiments at the Rice Experiment Station, Crowley, La.

Dr. F. E. Kempton, associate pathologist in charge of barberry eradication, will leave Washington about April 5 for an extended trip in the States of the barberry eradication area.

J. B. Sieglinger, associate agronomist in charge of the sorghum and broomcorn field experiments at the Woodward (Okla.) Field Station, has been authorized to present a paper on "Better Grain Sorghums for the Southwest," at the Conference of Central and Branch Station Workers at Manhattan, Kans., April 13 and 14.

G. A. Wiebe, assistant agronomist in charge of cereal experiments at the Aberdeen (Idaho) Substation, returned to Aberdeen March 24, having completed the graduate study course at the University of California.

VISITORS

Jaak J. Umarik, Chief of the Agricultural Education Division, Ministry of Agriculture, Tallinn, Esthonia, and Mihkel Pill, Director of the Plant Breeding Station at Jogeva, Esthonia, called at the Office in March. These gentlemen are interested in experimenting with varieties of southern grown oats, small samples of which will be sent from this Office through the Esthonian Legation at Washington.

MANUSCRIPTS AND PUBLICATIONS

24* A manuscript, entitled "Improved Oat Varieties for New York," by H. H. Love, T. R. Stanton, and W. T. Craig, was submitted March 20 for publication as a Department Circular.

25 A manuscript, entitled "Experiments in Rice Production in Southwestern Louisiana," by Charles E. Chambliss and J. Mitchell Jenkins, was submitted March 21 for publication as a bulletin in the Departmental series.

26 A manuscript, entitled "The Productiveness of Successive Generations of Self-Fertilized Lines of Corn and of Crosses Between Them," by F. D. Richey and L. S. Mayer, was submitted March 24 for publication as a bulletin in the Departmental series.

27 A manuscript, entitled "Rye Resistant to Leaf Rust, Stem Rust, and Powdery Mildew ," by E. B. Mains, was submitted March 26 for publication in the Journal of Agricultural Research.

28 A manuscript, entitled "Preliminary Environmental Studies on the Take-All Disease of Wheat Caused by Ophiobolus graminis Sacc.," by H. H. McKinney and R. J. Davis, was approved March 27 for publication in Phytopathology.

Galley proof of paper, entitled "Relative Susceptibility of Selections from a Fulghum-Swedish Select Cross to the Smuts of Oats," by George M. Reed and T. R. Stanton, for publication in the Journal of Agricultural Research, was read March 30.

Page proof of paper, entitled "Study of the Life History of Ecologic Relations of the Smut of Maize," by Alden A. Potter and Leo E. Melchers, for publication in the Journal of Agricultural Research, was read March 25.

Department Bulletin 1321, entitled "A Statistical Study of the Relation between Seed-Ear Characters and Productiveness in Corn," by Frederick D. Richey and J. G. Willier, was received from the Government Printing Office March 24.

*Manuscripts submitted since January 1, 1925, are numbered in chronological order.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 7

April 10, 1925
Personnel (Apr. 1-10) and Field Station (March 1-31) Issue

PERSONNEL ITEMS

J. M. Hamberly, senior scientific aid in corn investigations, will leave Washington about April 11 to plant the cooperative experimental corn plats on the Pee Dee Agricultural Experiment Station, at Florence, S. C.

Dr. H. V. Harlan, agronomist in charge of barley investigations, delivered a lecture on the agricultural and social conditions in Abyssinia before the Brooklyn Institute of Arts and Sciences, Friday night, April 10. Doctor Harlan also gave a talk on conditions in Abyssinia before the National Geographic Society in Washington, February 20.

Dr. F. E. Kempton, associate pathologist in charge of barberry investigations, left Washington April 5 for travel in the States of the barberry eradication area, where he will confer with officials of State institutions and with State leaders of barberry eradication. Doctor Kempton also will examine college and university herbaria for native and introduced species of barberry and make collections in New Mexico and California of native species of barberry for growing and testing for susceptibility to stem rust. He also will confer with Dr. W. W. Robbins, University Farm, Davis, Calif., regarding publications on the common barberry and its eradication by chemicals.

Miss Winifred Watson was appointed April 1 to assist in the office of the State leader of barberry eradication in Colorado, with headquarters at Fort Collins.

VISITORS

Capt. H. S. Eakins, of the Surgeon General's Office, War Department, recently called at the Office to obtain information on the identification of the more important commercial varieties of oats for the use of the Quartermaster Corps of the United States Army in the purchase of feed oats.

Dr. Hans Ludewig and Dr. Walther Ost, of the Chemische Fabrik v. Heyden, Dresden, Germany, were Office visitors early in April. They are introducing in this country their new seed treatment compound known as "Cuprobol," which they state is a colloidal copper product.

MANUSCRIPTS AND PUBLICATIONS

29 A manuscript, entitled "Breeding Oats Resistant to Puccinia graminis avenae," by S. M. Dietz, was approved April 6, for publication as an abstract in the Proceedings of the Iowa Academy of Science.

30 A manuscript, entitled "Barley: Culture, Uses and Varieties," by Harry V. Harlan, was submitted April 8 for publication as a Farmers' Bulletin.

Page proof of paper, entitled "The Germination of Barley under Late Spring Malting Conditions in India," by Harry V. Harlan, was read April 8.

The paper, entitled "A Handy Pollen Carrier," by C. E. Leighty and W. J. Sando, appears in the Journal of Heredity, v. 16, no. 2, p. 63-64, fig. 22-23. February, 1925. (Received April, 1925.)

Department Bulletin 1301, entitled "Report of the Northern Great Plains Field Station for the 10-Year Period, 1913-1922, inclusive," by J. M. Stephens, et al., was received from the Government Printing Office April 1. This bulletin contains (pages 65 to 67) the contribution, entitled "Investigations with Flax and Cereals," by J. C. Brinsmade, Jr., Assistant Agronomist, Office of Cereal Investigations.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (No report)

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig) (April 1)

Dr. H. H. Love sailed from San Francisco on March 21 for Nanking, China, where he will spend the summer in organizing a plan of plant improvement for China in collaboration with the Nanking University. Besides taking from this country a large number of varieties of oats, wheat, barley, cotton, and rice for experimental purposes, he expects to make a survey of native cereals to obtain material for improvement. Dr. C. H. Myers, of our department of plant breeding, expects to take up the direction of the work at Nanking after Doctor Love's return to this country next fall.

The wheat seems to have come through the winter in good shape, and at present the prospects are good for an average crop. The wheat and oats planted in the greenhouse are now ready to work and several crosses have been made.

The oat and barley material for the rod-row tests are ready for planting and will be sown as soon as the weather permits. The tests at Ithaca this year will consist of 4,200 rod rows of oats, 1,700 of barley, 3,830 of wheat, and 300 of rye, or about 10,000 rows in all, with 2,500 plant rows of oats and wheat.

There also will be tests of 13 varieties of oats in eight counties in the State and of five varieties of barley in four counties. These out-state tests are similar to the advanced test at Ithaca, the material being harvested and brought to Ithaca for threshing and yield determinations.

Two of Doctor Humphrey's cereal rust nurseries will be located in New York State this year, one at Ithaca and one near Philadelphia, Jefferson Co., N. Y.

Dr. Mihkel Pill, Director of the Plant Breeding Station at Jogeva, Esthonia, is spending a few months at Cornell, taking study courses at the College and becoming familiar with the methods used in our cereal investigations work.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (April 2)

The average rainfall in January was the greatest since 1891. That of February and March was less than half the normal in amount and frequency. The weather conditions in March were favorable for the preparation of the seed bed and the planting of the various crops. The highest temperature was 85° F. on March 11 and the lowest 36° F. on March 3.

The building of the new university two miles south of Baton Rouge is being completed rapidly and it is hoped that it will be ready for the fall term. All of the field crop experiments are being planted at the new experiment farm. Our corn experiments, with the exception of the selfed lines, were planted the last few days in March. Corn in other plats are up and growing rapidly. On March 16 a varietal corn experiment, in cooperation with the Office of Sugar-Plant Investigations, for the study of mosaic infection, etc., was planted at Southdown Plantation, Houma, La.

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (No report)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (No report)

INDIANA

Purdue University Agricultural Experiment Station, LaFayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, LaFayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, LaFayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (March 24)

The barberry eradication program for Wisconsin for the most part will consist of second survey of counties in the southern part of the State and some resurvey work necessary in some of the larger areas of escaped bushes. It is expected that activities will begin in Waukesha County on May 1.

An excellent field force is available in Wisconsin for this season, as many experienced scouts and men specializing in plant pathology have applied for positions.

A large amount of publicity is being arranged in the counties to be second-surveyed. A circular letter and bulletin will be mailed to all boxes on the rural mail routes of these counties. Publicity material will be sent to the rural schools. The plant pathology booth at the University Exposition held in April will have a large barberry demonstration as the leading feature.

Studies in overwintering have been carried on throughout the winter. The germination of uredospores was quite high until the latter part of December but recently has decreased to less than one per cent.

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (No report)

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (April 2)

March was a dry windy month with only 0.38 of an inch of rainfall. Some damage from soil blowing occurred on March 27. The situation was becoming more serious as the wind continued to blow and as the soil became more pulverized; however, it is now entirely reversed. Since yesterday morning 2.04 inches of rain has fallen. It was a slow gentle rain which has thoroughly saturated the ground. The last good rain in this section occurred on August 14.

Even though the winter has been dry and unfavorable little winterkilling occurred on the Cereal Project and wheat has made a fair start. With the additional rain the prospects can be said to be good. There is, however, a considerable Hessian fly infestation which may prove serious as the season advances.

Approximately 500 selections of barley were seeded in the nursery this spring. Many of these selections are from importations made by Dr. H. V. Harlan. These selections have been included in the experiments at Manhattan, as well as at the Colby station. The strains will, therefore, be grown under a wide range of conditions. The nursery at Hays is up and doing well.

Because of the dry winter and unfavorable conditions for wheat in this section, a number of fields have been abandoned and seeded to barley. There was a big demand for barley seed.

Wheat over most of western Kansas is in fair to good condition, except for half a dozen counties to the north and east of the Hays section.

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (April 1)

The weather for the month of March was dry and windy. Little or no precipitation has been recorded.

Seedings in the varietal experiment plats were made March 26, 27 and 28.

The uniform wheat and oat rust nurseries were sown on March 30 and 31, respectively. Other nursery plantings are being made as time and weather conditions allow.

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) [March 16]

Besides the usual inquiries regarding black stem rust and the common barberry, a large number of requests for information were made in February and March by country school teachers. Most of the inquiries were received through the college administration and forwarded to the State leader's office for attention. Several stated in their letters that the study of black stem rust is a part of the course of study in agriculture as prescribed by the State department. This is merely another example of the cooperation that is given by the Department of Public Instruction.

So far the educational work in South Dakota this season has been directed through the various colleges, Smith-Hughes schools, and regular high schools. From the above indications it appears that a letter and lesson plan to country schools would be well received.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (March 30)

The weather in March has been very changeable but for the greater part it was milder than usual in temperature and comparatively free from snowstorms. There was a total precipitation of 0.35 of an inch. Most of this was in the form of snow around the 10th of the month. A minimum temperature of -20° F. was reached on the 14th and a maximum of 64 degrees F. on the 25th.

The snow was practically all gone from the stubble fields by the middle of the month and plowed land was bare earlier in the month. During the past week warm weather and severe winds have dried the fields and considerable soil blowing has occurred in some fields.

Winter wheat plats protected in winter by standing cornstalks or by grain stubble are in fairly good condition. A continuation of the present dry, windy weather would cause many of the plants to die. That portion of the winter nursery sown on fallow is completely killed while that sown in short stubble shows a low percentage of survival.

Field operations began in this vicinity the latter part of last week. A field of Victory oats was sown at the Substation March 28. The cornland has been prepared for sowing the replicated cereal plats, and, if the weather permits, it is planned to begin sowing wheat varieties tomorrow. Seeding in March has been done at the Substation but once before in the past 10 years.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (No report)

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (No report)

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (No report)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (March 25)

The weather for spring seeding has been very favorable in eastern Oregon. In the Columbia Basin most of the farmers have completed their sowings of spring wheat. The damage to winter wheat from the cold weather in December was much more severe than was indicated by the earlier estimates. About 90 per cent of the winter wheat acreage in the counties of Sherman, Gilliam, Morrow and Umatilla has been reseeded to spring grain. There also has been severe damage to winter wheat in other counties, the amount of reseeding necessary ranging from 30 to 60 per cent of the winter wheat acreage.

On the station not a single plant of any cereal survived either in the nursery or larger field plats. The winter wheat varietal trial, the plats of the tillage experiments, and quite a large portion of the nursery were resown early in February. Good stands have been obtained in all cases and it is expected that the crop will mature.

The weather in March has been slightly warmer than normal with practically no precipitation. Soil moisture conditions throughout eastern Oregon are fairly favorable and it is expected that the spring wheat will produce fair yields if weather conditions during the growing season are fairly favorable.

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell) (March 23) [Berkeley]

I visited Davis yesterday and found that the cereal experiments are making very rapid growth. Quite a large number of barley varieties are beginning to head, but most of these are among the group of new varieties furnished from the Cereal Office. One of these varieties began heading on March 3 and has been fully headed for some time. A few of the wheats in the foreign-wheat nursery are beginning to head, as are also a number of rows in the hybrid material. The crosses in which one of these early forms was observed was Sunset x Hard Federation. None of the varieties of oats is showing indications of heading but nevertheless rapid growth is being made.

The bulk hybrid material from the crosses grown at Stanford last summer were sown in January. Seed from 19 crosses was sown and good stands were obtained in all of them. This group of plats probably will ripen about the middle of June.

The weather has been quite warm for the past few weeks so that the cereals have produced a rank growth. Should heavy storms occur no doubt there will be more or less lodging.

The commercial fields of cereals in the Sacramento Valley are in very good condition and there are prospects of a good crop.

Dr. H. H. Love of Cornell University visited Berkeley on March 20 before sailing for China. He sailed from San Francisco on the President Cleveland Saturday, March 21.

Agricultural Experiment Station, Berkeley (F. N. Briggs) (No report)

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Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 8

April 20, 1925
Personnel (Apr.11-20) and Field Station (April 1-15) Issue

PERSONNEL ITEMS

Dr. C. R. Ball, senior agronomist in charge of the Office of Cereal Investigations, left Washington late in the afternoon of April 18 for St. Louis, to attend the special convention of Experiment Station Directors April 20 and 21, and to present a paper on "Some Elements of Successful Cooperation in Research." Before his return to Washington Doctor Ball will make stops at Bloomington and Urbana, Ill., to confer with experiment station officials and others who are cooperating in cereal-disease experiments at those points.

J. M. Hammerly, senior scientific aid in corn investigations, returned from South Carolina on April 16 after completing the seeding of the experimental corn plats on the Pee Dee Agricultural Experiment Station, Florence, S. C. Mr. Hammerly reports that it was very dry and hot at Florence during the first half of April. Cotton planting was progressing favorably.

Dr. H. V. Harlan, agronomist in charge of barley investigations, left Washington April 15 for points in Ohio, Indiana, Arizona, Oklahoma, Kansas and Illinois to confer with Federal and State officials and grain specialists in regard to methods of barley culture, to study field conditions, and to take notes on and harvest barley seed on cooperative experimental plats. Doctor Harlan will return to Washington about the middle of June.

Dr. A. G. Johnson, senior pathologist in charge of the investigations of diseases caused by imperfect and sac fungi, left Washington April 18 for a two-months' inspection of cereal-disease experiments in Texas, Arizona, California, Oregon, Washington, Idaho, North Dakota, South Dakota, Minnesota, Wisconsin, Illinois, Indiana and North Carolina.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, left Washington April 15 for a two-months' trip in the interests of wheat investigations. He will take notes on and harvest wheat varieties, hybrids and selections in the various cooperative experiments, and confer with cooperating agencies at Granite City, Ill., St. Louis, Mo., Manhattan, Kans., Wakita, Okla., Knoxville, Tenn., Lincolnton, N. C., and Sacaton, Ariz.

Miss M. L. Martini, assistant in barley investigations, left Washington April 19 for Sacaton and Phoenix, Ariz., and Manhattan, Kans., where she will study and harvest barley varieties in the cooperative breeding nurseries. She will be in the field about two months.

B. Y. Morrison, junior horticulturist in charge of the barberry experiments at the Berberis Garden, Bell, Md., has been authorized to go to Cincinnati, Ohio, about May 1 to identify the various species and hybrids of barberries in the city parks of that city.

C. S. Reddy, associate pathologist in charge of bacterial diseases of cereals, will leave Washington on April 25 for Indiana and Illinois, where he will study the bacterial diseases of corn and grasses and assist in cooperative corn seed treatment experiments. He also will make a field study of bacterial diseases of corn and grasses in Arkansas, Oklahoma, Kansas, Iowa and Wisconsin, and conduct laboratory studies at Manhattan, Kans., Bloomington, Ill., and Madison, Wis.

F. D. Richey, agronomist in charge of corn investigations, will leave Washington about April 25 for Burdette, Ark., where he will supervise the planting of corn experiments on the Burdette Plantation in concluding a series of cooperative experiments begun a number of years ago.

VISITORS

Prof. D. N. Borodin, American representative of the Russian Bureau of Applied Botany and Plant Breeding, with headquarters in New York City, was an Office visitor April 16.

Prof. C. A. Mooers, Director of the Tennessee Agricultural Experiment Station, was an Office visitor on April 14 to discuss cooperative cereal experiments.

A party of German scientists, consisting of Dr. Fred Hagedorn. Under Secretary of Agriculture (agricultural economics and finance); Dr. Theodor Brinkmann, professor of farm economics of Bonn University; Dr. George Keuhne, expert on agricultural machinery of Munich University; Dr. Theodor Roemer, professor of plant breeding of Halle University; and Joachim Deiche, a large farm owner and former director of the livestock breeding department of the German Chamber of Commerce, has been visiting the various bureaus of the U. S. Department of Agriculture. When the party called at the Office of Cereal Investigations on April 20 Doctor Roemer was provided with a detailed itinerary in order that members of the party might visit the various plant breeding activities in the northern United States.

MANUSCRIPTS AND PUBLICATIONS

31 A manuscript, entitled "Black Stem Rust and the Progress of Barberry Eradication in Wisconsin," by William A. Walker and Noel F. Thompson, was submitted April 17 for publication as a bulletin by the Wisconsin Department of Agriculture. (The results reported in this manuscript are based on investigations conducted cooperatively by the Wisconsin Department of Agriculture, the Agricultural Extension Service of the University of Wisconsin, and the Office of Cereal Investigations.)

32 A manuscript, entitled "Oat Blast," by Charlotte Ellictt, was approved April 20, for publication in Phytopathology.

Page proof of paper, entitled "Relative Susceptibility of Selections from a Fulghum-Swedish Select Cross to the Smuts of Oats," by George M. Reed and T. R. Stanton, for publication in the Journal of Agricultural Research, was read April 16.

The paper, entitled "A Study of Variability in the Burt Oat," by Franklin A. Coffman, John H. Parker, and Karl S. Quisenberry, appears in the Journal of Agricultural Research, v. 30, no. 1, p. 1-64, 9 pl., 1 fig. January 1, 1925. (Received April 11, 1925)

Bulletin No. 264, of the Illinois Agricultural Experiment Station, entitled "Wheat Rosette and Its Control," by H. H. McKinney, R. W. Webb, and G. H. Dungan, has been received, bearing date of April, 1925. (The experiments on which this bulletin is based were conducted in cooperation with the Office of Cereal Investigations, Bureau of Plant Industry, U. S. Department of Agriculture.)

FIELD STATION CONDITION AND PROGRESS

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (April 15)

The fall-sown grains, as measured by the stage of growth at this time, are about 10 days advanced in comparison with the average year. The first heading of Abruzzes rye and Nakano Wase barley was noted on April 9 and 11, respectively. In general, the grains have tillered sufficiently, and so far as stands are concerned there are some varieties of all four cereals, namely, barley, oats, rye and wheat that give indications of producing yields above the average.

More than the usual number of scientific studies have been made in the greenhouse during the past winter. Hybridizing has been done by various members of the Office of Cereal Investigations, particularly among those varieties of cereals which under field conditions show a wide divergence in flowering dates. In addition some physiological and genetical studies have been carried on. Studies of inheritance and sterility in hybrids of distant species continue on a large scale, and some of the material now in the F_3 and F_4 generations is showing an uncommon mode of inheritance.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig) (No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) (April 13)

Owing to favorable weather conditions spring seeding has progressed quite satisfactorily. The sowing of the oat nursery was completed on April 6. Sowing of the different strains and varieties of oats in the field plat series is practically completed. Only six 20th-acre plats yet remain to be seeded. These have been held to provide space for the few new varieties which may come in late.

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (No report)

INDIANA

Purdue University Agricultural Experiment Station, LaFayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, LaFayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, LaFayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (No report)

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (No report)

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (April 16)

The weather for the first half of April has been very favorable for crop growth. A precipitation of 1.34 inches has been recorded to date. Winds have been common. The highest average wind velocity for any one 24-hour period was 25 miles an hour. The maximum temperature recorded was 79 degrees F. and the minimum 31 degrees.

All seedings have emerged and are growing nicely. Winterkilling was not serious on most wheat plats but was very erratic in its occurrence.

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) (No report)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Maycue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (April 15)

In the first half of April the weather was unusually warm; the mean temperature for that period being 51 degrees, which is nearly as warm as the normal mean temperature for the month of May. The first cold spell of the month began yesterday, and the lowest temperature was reached this morning with a minimum of 22 degrees. The weather has remained comparatively dry with a precipitation of only 0.19 of an inch so far this month.

As a result of continued mild weather, seeding operations in this district have progressed without interruption since the last week of March and farmers are now well along with their seeding. The greater part of the plat seeding at the Substation was completed earlier than in any previous year. Varietal plats of spring wheat were sown March 31, those of oats on April 1, and the barley plats on April 4. In the date-of-seeding experiment with flax and in the date-and-rate of seeding experiment with Marquis, Kota, and Nodak wheats the first seedings were made on April 4, and the second will be made April 16.

The varietal plats of wheat are just emerging, but rain is needed to insure the uniform germination of the oat varieties.

The seeding of the replicated nursery rows of wheat, oats, and barley varieties was completed April 14. There remains a large number of wheat and oat hybrids and barley selections to be sown in single rows. It is intended to sow the varietal plats of flax and the flax-wheat mixtures experiment about the first of May, giving time for weed seeds to germinate and be destroyed by cultivation before seeding.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (April 16)

The period from January 1 to date has been chiefly characterized by mild temperatures and low precipitation. The total precipitation for the months of January, February and March amounted to only 0.75 of an inch, and that for the first half of April was only 0.05 of an inch. Maximum temperature for the first half of April was 81 degrees on April 10, minimum 26 degrees on April 15. There were only three days in the first half of April when the temperature dropped below freezing.

Reports from over the county indicated that considerable wheat was being sown the first week in April.

The wheat varietal plats were sown April 7, and the oat varietal plats April 8. This exceeds all previous records for earliness of seeding by several days. The previous record for earliness of seeding wheat was April 12, in 1918, and the average date of seeding the wheat varieties is April 19, for the ten years 1916 to 1925, inclusive.

Seeding of the wheat nursery commenced yesterday. The last of the rows to be sown with the planter were put in today, but no further seeding was attempted on account of rain.

Ralph M. Williams, who returned to work here April 1, has been assisting with the seeding of plats and nursery.

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (April 15)

There was considerable winterkilling of winter wheat in the Judith Basin the past winter. Some farmers are planning on reseeding their winter-wheat land to spring wheat. Perhaps not to exceed 30 per cent of the winter-wheat acreage will be reseeded to spring wheat. It is a little too early to determine the extent of winterkilling.

One hears much favorable comment this spring on the furrow method of seeding winter wheat, though occasionally a few farmers are not enthusiastic about it. The wheat sown with the furrow drill at the State experiment station is looking much better than the wheat sown with the ordinary drill, but the wheat has not made sufficient growth to determine the percentage of survival.

I began sowing the spring grain varieties today. It is raining tonight (April 15) and the rain will likely turn to snow.

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (No report)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (April 10)

The land which it is intended to crop at the Station this year was fallowed in 1924. This land was just about dry enough to plow on March 28; it began to rain on that date, however, and up to April 4 a total of 2.73 inches of rain fell. We have had poor drying weather since the rains ceased, and as a result it probably will be a week yet before it will be possible to start plowing. The rain has been general over nearly the entire State and almost certainly will make good hay and cereal crops this year.

University Farm, Davis (V. H. Florell) (April 10)

There has been much rain in California this spring. Last week a precipitation of five inches was recorded at Davis and it is raining again today. The prospects for the grain crop are very good, but there probably will be a great deal of lodging in the fall-sown fields; some grain already is quite badly lodged.

Agricultural Experiment Station, Berkeley (F N. Briggs) (No report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 9

April 30, 1925
Personnel (Apr. 21-30) and Project (Apr.1-30) Issue

PERSONNEL ITEMS

Dr. J. C. Arthur, Professor Emeritus of Botany, of Purdue University, gave the following two lectures under the auspices of the Graduate School of the U. S. Department of Agriculture:

1. Botany and Botanists in the Eighties. Tuesday, April 28.

2. The Rusts and Their Habits. Wednesday, April 29.

The lectures were given in the Motion Picture Laboratory of the Department at 1363 C St., S. W.

Doctor Arthur has had a wide experience in botanical investigations and teaching in Minnesota and Wisconsin, and at Geneva and Purdue University, and has taken a very active part in botanical organizations. He is an authority on the rusts and related fungi, and is an able speaker.

Dr. C. R. Ball, senior agronomist in charge of the Office of Cereal Investigations, returned April 21 from St. Louis, Mo., where he attended the special convention of Experiment Station Directors held April 20 and 21.

All the States with the exception of Idaho were represented. The sessions were characterized by a full attendance and strict attention to the important business of planning for the organization of projects, primarily in agricultural economics, home economics, and rural sociology, to be financed by the funds made available on July 1, 1925, under the Purnell Act. Problems of national scope were considered first, about fifty being suggested and six being selected for final consideration. These are to be attacked cooperatively on a national scale.

The Convention then separated into a series of regional conferences, the geographic division being the northeastern States, the southern States, the Corn Belt, and the western mountain and intermountain States. Each regional conference selected a group of regional problems for cooperative investigations by the Stations and other agencies within the region. The entire conference was characterized by a spirit of responsibility, broad-mindedness, and hearty cooperation. The prepared addresses presented on the first day are being mimeographed and distributed. These will include the one by Doctor Ball on Some Elements of Successful Cooperation in Research.

Charles E. Chambliss, associate agronomist in charge of rice investigations, returned April 29 from the southern rice growing district. He reports that it was excessively dry in southwestern Louisiana. About 80 per cent of the rice crop in that region was seeded under ideal soil conditions, but the absence of spring rains and the presence of salt water in the streams are causing the rice growers anxiety as to the future.

G. A. Wiebe, assistant agronomist in charge of cereal experiments at the Aberdeen (Idaho) Substation, returned to Aberdeen on March 24 from the University of California, where he was engaged in part-time graduate study during the fall and winter.

VISITORS

Otakar Kukula, a graduate of the University of Agriculture at Prague, Czechoslovakia, has made his temporary headquarters in the Office of Cereal Investigations, to study the Department's methods of plant breeding with special reference to cereal production, and to avail himself of the facilities of the Department library. Later Mr. Kukula, who has had experience in managing a large estate in his native country, will locate on a field station for further study.

Cornelis J. Uys, of the agricultural department of Pretoria, Transvaal, South Africa, and at present a student at Cornell University, called at the Office of Cereal Investigations to make inquiries concerning corn varieties adapted to the conditions of South Africa.

MANUSCRIPTS AND PUBLICATIONS

33 A manuscript, entitled "New Seed Disinfectants for the Control of Bunt of Wheat and the Smuts of Oats and Barley," by W. H. Tisdale, J. W. Taylor, R. W. Leukel and Marion A. Griffiths, was approved April 22, for publication in Phytopathology.

34 A manuscript, entitled "The Mosaic Disease of Winter Wheat and Rye," by H. H. McKinney, was approved April 27 for publication in Science or Phytopathology.

35 A manuscript, entitled "Single-Bath Hot-Water and Steam Treatments of Seed Wheat for Control of Loose Smut," by V. F. Tapke, was submitted April 28 for publication as a Department Bulletin.

Department Bulletin 1275, entitled "Varietal Susceptibility of Oats to Loose and Covered Smuts," by George M. Reed, Marion A. Griffiths, and Fred M. Briggs, was received from the Government Printing Office April 21. (In cooperation with the Idaho, Iowa, Kansas, Missouri, and Washington Agricultural Experiment Stations and the Brooklyn Botanic Garden.)

Department Bulletin 1309, entitled "Experiments with Small Grains on the Arlington Experiment Farm," by John W. Taylor, was received from the Government Printing Office April 23.

The experiments on which Bulletin 264 of the Illinois Agricultural Experiment Station (mentioned in the Cereal Courier of April 20) are based were conducted not only in cooperation with the Office of Cereal Investigations, but with the Wisconsin and Indiana agricultural experiment stations. The recognition of this cooperation was inadvertently omitted and the information will be supplied by means of a rubber stamp on all copies of the bulletin not already distributed.

I M P O R T A N T

April 29, 1925

MEMORANDUM NO. 532

Federal Business Associations

Attention is invited to previous memoranda issued by the Department relative to the organization of Federal Business Associations in many of the principal cities throughout the country, and requesting all officers and employees of the Department of Agriculture to cooperate to the fullest extent in connection with these agencies and to avail themselves of the services which they are prepared to render. The spirit of cooperation displayed by the field personnel of the Department of Agriculture in these matters has been highly commendable.

Recently it has been pointed out that with recurrent changes in the field forces a clear understanding does not in every case exist as to the program of cooperation between the field forces of the several departments and these coordinating agencies, as laid down by the President as a general policy of the government. It is pointed out that the chain of Federal Business Associations throughout the country is the branch of the coordinating service which most effectively carries the spirit of cooperation to the widely scattered army of Federal officials, that the success and usefulness of these associations depend, of course, upon the active interest of the individual members, and that it is important that such interest be shown by the officials of all local branches of the Government.

In order to meet the situation caused by changes of personnel in the field service and to insure the fullest possible support to the President's policy of economy and efficiency in the transaction of Government business, it is hereby established as a definite policy of the Department that all executive officials and their principal subordinates connected with the field units of the Department throughout the United States and its possessions will associate themselves with the local Federal Business Associations, wherever they have been organized, and that they will take an active interest in the work of these associations. It is also desirable that officials of the Department take an active part in the formation of new Federal Business Associations in places indicated by the Coordinator for the Area in which they are located. These associations are active, constructive executive auxiliaries, contributing powerfully to efficient Federal business organization by cooperative effort between the various Departments.

W. M. JARDINE

Secretary.

PROJECT REPORTS

OAT INVESTIGATIONS

(T. R. Stanton, Agronomist in Charge)

BREEDING OATS FOR SMUT RESISTANCE

A number of crosses between the smut-immune variety, Markton, and some of the best standard varieties have been made for development of resistant varieties and strains of oats. As early as 1919 at the suggestion of D. E. Stephens, Superintendent of the Sherman County (Oreg.) Branch Station, crosses were made in the greenhouse at the Arlington Experiment Farm, Rosslyn, Va., between Sixty-Day and the selection C. I. No. 357-1, which was later named Markton. Its immunity from smut at that time had not been determined, and the cross was made for agronomic reasons only. Selections from these crosses have been grown at the Sherman County Branch Station since 1921 in agronomic nurseries. To determine the smut resistance of these hybrid strains a relatively large number of seeds was dehulled, inoculated with smut spores, and sown this spring at the Sherman County Branch Station and the Iowa Agricultural Experiment Station. It is believed that a number of these selections should prove to be resistant to smut and thus make available early, smut-resistant strains similar to the Sixty-Day variety.

In the summer of 1923 crosses were made by G. A. Wiebe at the Aberdeen (Idaho) Substation between Markton and the following varieties: Idamine, Victory, Aurora, Swedish Select, Scottish Chief, Ligowa and Early Champion. The F_1 generation plants of these crosses were grown in the greenhouse at the Arlington Experiment Farm in the winter of 1923-24. The F_2 generation plants were grown at the Aberdeen Substation the following summer. From the first three crosses named, approximately 22,000 F_2 seeds inoculated with a mixture of spores of both smuts were sown at the Aberdeen Substation this spring. From each F_2 plant 50 dehulled and 50 hulled seeds were sown. Approximately 12,000 seeds of the Markton x Swedish Select cross which had been treated similarly, were sown at the Dickinson (N. Dak.) Substation. Likewise, about 5,000 F_2 seeds of the Markton x Scottish Chief cross were sown by B. B. Bayles at the Sherman County Branch Station, Moro, Oreg. A number of F_3 progenies from Early Champion x Markton and Markton x Ligowa, crosses which were sent from the Aberdeen Substation in the spring of 1924, also will be grown in 1925 at the Sherman County Branch Station.

In 1924 at the Aberdeen Substation, two additional crosses were effected between Iogren and Markton and Markton and Silvermine. Seed from the F_1 plants of these crosses has been dehulled, inoculated with smut spores, and sent to the Aberdeen Substation for sowing this spring. These crosses besides furnishing a great deal of material for the selection of smut-resistant strains also should give opportunity for extensive studies on the inheritance of smut resistance and other characters in oats.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 10

May 10, 1925
Personnel (May 1-10) and Field Station (Apr.16-30) Issue

PERSONNEL ITEMS

Dr. A. G. Johnson was at Lincolnton, N. C., on April 20 where he examined the take-all plats, which showed striking symptoms of take-all.

At San Antonio, Tex., on April 23, Doctor Johnson found the weather conditions extremely dry. Mr. Dillman's flax plantings looked thrifty and nothing of special interest in the way of diseases was found. In certain of the barley plantings considerable stripe was observed. It was of special interest that under such extremely dry conditions the barley plants affected with stripe remained chiefly in the rosette stage, also that the loose smut of barley invaded the upper leaves in almost every case. This latter condition also was noted at Sacaton, Ariz., where the grain was grown under irrigation.

Doctor Johnson left Berkeley, Calif., on May 7 one week ahead of his itinerary expecting to arrive at Corvallis, Oreg., May 11.

F. D. Richey, agronomist in charge of corn investigations, returned from Burdette, Ark., on May 4.

T. R. Stanton, agronomist in charge of oat investigations, will leave Washington on May 11 for a trip through the South and Southwest in the interest of oat investigations. He will visit agricultural experiment stations in North Carolina, South Carolina, Georgia, Alabama, Louisiana, Texas, Oklahoma, Arkansas, Tennessee and Virginia. In addition to making observations on oat experiments, Mr. Stanton expects to make some study of the general occurrence of the false wild forms of oats in the Fulghum variety, and to confer with experiment station officials regarding the occurrence of these forms in commercial grain samples. Mr. Stanton will be in the field about four weeks.

VISITORS

Albert H. Ochsner, a rice grower, of the Hacienda Paso del Rio, Tecoman, Colima, Mexico, was an Office visitor on May 7 interested in getting information on rice varieties and threshing outfits.

Señor M. Zavala, of the Nicaraguan Legation in Washington recently visited the Office again for the purpose of collecting samples of corn, rice and oats adapted for cultivation in Nicaragua.

MANUSCRIPTS AND PUBLICATIONS

36 A brief paper, entitled "The Harmful Barberry--Destroy It," by Lynn D. Hutton, was approved May 2 for publication in The Bulletin of the Green Section of the United States Golf Association.

37 A paper, entitled "The Inheritance of a Purple Plumule Character of Maize," by Merle T. Jenkins, was approved May 7 for publication in the Journal of Heredity.

Galley proof of Department Bulletin 1334, entitled "Tests of Barley Varieties in America," by Harry V. Harlan, Mary L. Martini and Merritt H. Pope, was read May 9.

Department Bulletin 1316, entitled "Some Effects of Sodium Arsenite when Used to Kill the Common Barberry," by E. R. Schulz and Noel F. Thompson, was received from the Government Printing Office May 2, bearing date of April, 1925. (The investigations described in this bulletin were conducted cooperatively by the Office of Cereal Investigations and the University of Wisconsin and the Wisconsin Department of Agriculture.)

The paper, entitled "Study of the Life History and Ecological Relations of the Smut of Maize," by Alden A. Potter and Leo E. Melchers, appears in the Journal of Agricultural Research, v. 30, no. 2, p. 161-173, 3 pl., 2 fig. Jan. 15, 1925. Literature cited, p. 173. (Received from the Government Printing Office May 4, 1925)

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (No Report)

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig) (April 29)

Very satisfactory progress has been made with the cereal experiments this month. The nurseries of spring wheat and oat-hybrid material were seeded April 8 and 9. The rod rows of oats and Doctor Humphrey's rust nursery were sown April 23 to 25. Barley rod rows and the drill and increase plats of oats and barley were sown April 25 to 29. This is much earlier than usual for sowing oats and barley in New York State.

Winter wheat is looking very well and the prospects are promising for a good test.

Six of the oat and four of the barley tests out in the State already have been sown. The test in Jefferson County, where one of Doctor Humphrey's rust nurseries will be located, will be sown just as soon as conditions there are favorable.

A cablegram has been received from Dr. H. H. Love, telling of his arrival at Shanghai, China.

Dr. V. Lathouwers, of the Agricultural Institute at Gembloux, Belgium, is spending six months at Cornell University, taking certain courses in the College and becoming acquainted with our methods of cereal investigation.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (May 2)

During almost the whole month of April the weather in Missouri was warm and favorable for farming operations. The season seemed about two weeks earlier than normal. Corn planting is almost completed in the southern part of the State and is well started in the northern part. Wheat came through the winter in very good condition, although for a period of more than a month most of the wheat crop was covered with a coat of ice.

Work on the Station field also is well advanced for the season. The sowing of oats was delayed slightly beyond the best period, but the crop is now growing well. Wheat on the Station field is in excellent condition. A small quantity of corn has been planted in the genetics experiments and the bulk of the crop will be sown next week.

Our investigations on the genetics of maize will be somewhat more extensive this season than in the past. An elaborate study will be made of variation in crossing over, continuing the studies of the last two seasons, the results of which are now in press. In addition, we are beginning an intensive study of variation in the rate of mutation and of the effect of various factors on the rate.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (No report)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (April 14).

On a farm in Fayette County, near Ramsey, volunteer oats were found to be infected with stem rust in the uredinial stage, October 22, 1924. Wire was looped around the infected plants and attached to wooden stakes. On April 11, 1925, this same field was inspected. The oat plants were dead and no trace of stem rust could be found.

In Monroe County near Waterloo on the same date in 1924, some volunteer oats were found to be rusted with both leaf and stem rust. The rusted plants were marked with stakes and wire was looped around each infected plant and fastened to a stake. On April 12, 1925, these plants were again examined. A large number of stem rust pustules in the telial stage were found on the dead oat plants, but no trace of stem rust in the uredinial stage could be found.

In Marion County on the outskirts of Centralia on October 22, 1924, some timothy plants growing near an old barn in the vicinity of the U. S. Entomology experiment plats were found heavily rusted with both leaf and stem rust. Some of the rusted plants were marked with stakes. Straw also was placed on some of the rusted timothy plants. This station was thoroughly examined on April 13 and no trace of leaf or stem rust could be found on the timothy plants.

At the present time there is not the slightest indication that the uredinial stage of stem rust is present in Illinois.

On April 11 a barberry hedge was examined near Rosamond in Montgomery County. The bushes were well leafed out but no aecial infection was found.

A trace infection of leaf rust on wheat was found in Madison, St. Clair, Monroe, Randolph, Perry, Washington and Marion Counties.

In Marion County near Farina a moderate infection of leaf rust was found on rye.

No stem rust in the uredinial stage was found.

(May 4)

The original survey of Piatt County was started on April 16. The resurvey of Stephenson County also was begun on April 16.

Two new trucks were delivered this month and arrangements were made to rent several trucks for use this summer.

A campaign of education has been carried on this spring among the small colleges in Illinois. Lantern slides, the large panel, bulletins, rust specimens and other demonstration materials were sent out to the colleges. Instructors have devoted time to the study of the black stem-rust disease and the results have been gratifying.

About 57,000 form letters have been prepared for mailing to rural box holders this summer when the survey activities are begun in a county.

Practically all the field men have been engaged and a great deal of time is now being devoted to getting the men informed in regard to the survey.

(May 5)

Mr. Frolik reports that conditions this year seem to be especially favorable for barberry infection south of the eradication area. As no infection has ever been found on barberries in southern Illinois, south of Pana, a special effort is being made to locate some rural barberry bushes through this section and watch them throughout the season.

On a week's trip south to Charleston, Olney, Lawrenceville, Mt. Carmel, Carmi, Mt. Vernon, and then north Mr. Frolik located several barberry bushes, but none of these was infected, although at Olney he found abundant telia material on Agrostis alba around barberry bushes on Doctor Ridgeway's estate. No doubt some infection will develop on these bushes later on.

At Rosamond, Ill., there was considerable infection on barberries, about 35 per cent of the leaves being infected. This is a considerably heavier infection than developed on the bushes last season. The rust was mostly in the pycnial stage although a few cluster cups were found already open and shedding spores. Undoubtedly a much heavier infection will develop on these bushes later on in the season.

At Olney Doctor Ridgeway was interviewed concerning rural locations. He said that he knew of no barberries in the county outside those on his estate--all Asiatic species--and two locations in Olney information concerning which he gave Mr. Frolik.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (April 29)

Six agents of the U. S. Department of Agriculture and two inspectors of the Ohio Department of Agriculture started the original survey in Portage County on April 1. All of the men, except one, had worked previously on barberry eradication in this State. The much discussed "every woodlot scouting method" is being given a trial in Portage County. This is an experiment in Ohio. The scouts walk continuously, inspecting all farmsteads, woodlots, stream banks, abandoned pastures and fence rows for the presence of common barberries.

In the month of April these eight scouts were able to cover approximately 125 square miles according to the new plan. This constitutes about one-fourth of the area of the county. Seventy-six locations have been found so far; 44 were rural locations, of which 31 were escapes. It is perfectly clear that locations are being found by the new method that would not have been located by the old method.

Dr. F. E. Kempton was a visitor on April 6.

An extensive search for the early occurrence of rust on barberries has been made this spring and the data obtained are summarized below.

Date of Observation	Location: County	Nearest City	Results	Name of Observer
April 6	Franklin	Columbus	No rust	John W. Baringer
" 9	Clark	New Carlisle	" "	" " "
" 10	Montgomery	West Carrollton	" "	" " "
" 11	Clermont	Glenn Este	" "	" " "
" 12	Preble	Lewisburg	" "	" " "
" 13	Montgomery	Dayton	" "	" " "
" 13	Clark	New Carlisle	" "	" " "
" 14	Madison	London	" "	" " "
" 17	Portage	Kent	" "	" " "
" 18	Montgomery	Dayton	Pycnia	B. B. Beck
" 21	Mercer	Ft. Recovery	"	Harry Atwood
" 24	Clark	New Carlisle	"	John W. Baringer
" 24	Montgomery	Dayton	"	" " "
" 24	"	West Carrollton	"	" " "
" 25	Clermont	Glenn Este	"	" " "
" 25	Portage	Nelson	"	B. B. Beck
" 27	Montgomery	Dayton	Aecia	John W. Baringer
" 27	Shelby	Sidney	Pycnia	" " "
" 27	Preble	Lewisburg	Aecia	" " "

Rain and snow were general in central Ohio on March 29. After that date there was but little precipitation thrcughout the State until April 9 and 10, when rain fell in abundance in many places. This was the first rain of importance after the leaves of the barberries unfolded from the buds. It seems that the first infection appeared on barberries in the Miami Valley seven to ten days after the rain on April 9 and 10.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, C. A. Aamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (May 1)

Recently a lesson plan on the relation of common barberry to black stem rust was prepared and sent out to all agricultural instructors in the State of Minnesota. A set of questions for the guidance of field men also has been prepared and is to supplement oral instructions. Envelopes for 25,000 circular letters are now being addressed. These will be mailed before the second survey is begun.

The work during the last few months has been directed toward a plan to effect a close cooperation with the weed inspection service in Minnesota. The Minnesota Weed Law gives the County Commissioners the option of appointing county weed inspectors. If no county weed inspectors are appointed, the township chairmen are required by law to look after the weed inspection duties in their townships. There are 1,900 township chairmen whom we are trying to enlist to aid the barberry eradication campaign. Our greatest problem is to get all of them actively interested in barberry eradication and to teach them how to identify common barberry. In the first part of March, weed conferences were held in Red Lake, Polk, Marshall, Kittson and Norman Counties. It was gratifying to note the interest manifested in barberry eradication by the farmers in the Red River Valley. Hardly a "doubting Thomas" was encountered.

Starting on the 15th of May, a weed conference will be conducted in every county. The law requires that all men engaged in weed inspection duties be at these conferences. Arrangements are now being made to present the barberry eradication phase of weed inspection at all the conferences in counties where no second survey or resurvey is scheduled for this year. While working on second survey or resurvey, the barberry field men will be required to confer with every township chairman in the counties in which they work. In addition, all records of previous common barberry finds have been copied on individual township reports which will be sent out to each township chairman with a letter of instructions which specifies that these township chairmen inspect immediately all properties on which common barberry has been found. While this arrangement seems ideal, there is some question as to what percentage of these men actually will aid in barberry eradication in their township. We are doing everything possible to get in touch with these men and to increase their "batting average." However, if this is done for the next four or five years, we shall gradually build up an organization which will be effective in aiding the campaign.

We have had exceptionally favorable spring weather this year. Two teams of scouts will start on resurvey May 1. The country roads are in very fine condition. Although the common barberry is fairly well leaved out, we were unable to find any pycnia of Puccinia graminis on April 24.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (May 2)

The winter and early spring drought was broken by a week of rains. The precipitation for the first four months of 1925 has been as follows:

January	0.14 of an inch
February	0.12 " " "
March	0.40 " " "
April	3.18 inches.

Because of the drought the uniform rust nursery was not sown until April 4, and then it had to be watered to insure germination. Lack of rainfall during the winter months accounts for the small oat acreage in this district.

The first date-of-seeding plats were seeded on April 17 and had emerged to fair stands by the 27th. The second date-of-seeding plats were seeded May 1 under very favorable conditions.

Judging from the volume of seed sales to date there will be more grain sorghums and less broomcorn sown in this vicinity than last year. Wheat was reduced in yield by the dry weather in March and early April; while very vigorous now, the heads are short and the yield can not go very high.

It appears at present as though grasshoppers will be a serious pest this year, large numbers being present this early in the season.

The last killing frost this spring occurred on March 27 with a temperature of 29°. The maximum temperature for April was 95° on the 20th and the minimum, 35° on the 29th.

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (April 30)

The precipitation for April amounted to 4.16 inches. The weather has been warm and the spring is about two weeks in advance, as compared to former seasons. With moisture and warmth all small-grain crops are making a very rapid growth.

Wheat on fallow is now in the jointing stage with heads forming in the boot. The wheat growth on fallow probably is too rank for best results. Wheat on cropped land, as compared with fallow land, is much retarded because of the poor start last fall. In general the fields of wheat have made about a normal growth, but the stand is thin. In some sections entire fields have been abandoned. Many fields are heavily infested with the Hessian fly, which is now in the active larvae stage.

Spring wheat, oats and barley are making satisfactory growth. Winter barley was entirely winterkilled.

The seed bed for the experimental sorghums and corn is now being prepared on the Cereal Project, and most of the seed has been packeted.

The annual Experiment Station Round-Up was held on April 25. The attendance probably was 1,400. More interest was manifested in the program this year than has been apparent for a number of years. Not only were the feeding results given out, but problems on crop production were discussed. Livestock and grain judging contests also were held on the day preceding the round-up. Fifty teams of high-school boys and girls were entered in the two contests. The grain judging contest was the first ever held on the station.

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (April 30)

A precipitation of 0.76 of an inch has been recorded in the last 15 days. For the most part the weather has been very favorable for crop growth. On April 28 a temperature of 24° was recorded. The maximum for this period was 87°.

Corn planting was begun this morning. Winter wheat is nearly a foot high and in spots is beginning to show the effects of drought. Border effects on the plats are very noticeable. Spring grains were injured slightly by the heavy frost April 28 but are recovering nicely.

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) (No report)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (April 30)

The weather of the latter half of April has been somewhat cooler than that of the first half. The lowest temperature for the month was reached this morning with a minimum of 20 degrees. A rainy period occurred last week with a precipitation of 0.98 of an inch for the week, making a total of 1.26 inches for the month.

Seeding in the cereal nursery was resumed this week and was almost finished today, with the exception of proso varieties. The seeding of varietal plats is completed with the exception of flax and proso varieties. The replicated varieties of wheat, oats and barley in both plats and nursery have emerged with fairly good stands.

The first seeding in the date-of-seeding experiment with flax has emerged and the second is emerging. The third seeding will be made tomorrow. The varieties of flax and the flax-wheat mixtures will be sown in the near future.

Wheat seeding is nearly finished in this locality and the seeding of barley and oats is well along.

The condition of the winter wheat has improved since the rains of last week. Stand counts to determine the percentage of survival will be made next week.

Supt. J. M. Stephens of the Northern Great Plains Field Station, Mandan, and John T. Sarvis visited the Substation last week.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (May 2)

The last half of April has been chiefly characterized by low temperatures and high winds. Maximum temperature, 72° on April 23; minimum, 22° on April 29. There were four days on which freezing temperatures were recorded, namely, April 25, 28, 29 and 30. The average wind velocity for the period was 8.7 miles per hour. Precipitation for the period was 0.89 of an inch, most of which fell in small showers of cold rain and some snow. The total precipitation for April was only 0.94 of an inch, compared with a normal precipitation of 1.67 inches. The total precipitation for the months of January, February, March and April was only 1.86 inches, compared with the normal precipitation of 3.55 inches for this period.

The winter-wheat nursery seedings were completely winterkilled, though the winter rye came through all right. Barley was sown on the varietal plats on April 21 and is just coming up. The flax and cereal mixtures were sown April 21. The second seeding in the date-of-seeding-and-tillage experiment was made May 1. The uniform rust nurseries of wheat and oats were sown April 30. This completed the sowing of the cereal nurseries except for some seed that has not been received.

The wheat varietal plats sown April 7 emerged about April 20. The oat varietal plats sown April 8 emerged about April 21. The wheat nursery sown up to April 18 emerged with good stands.

Flax sown April 15 in the date-of-seeding-and-tillage experiment emerged about April 30 but with stands reduced considerably by frost. Twenty-five per cent probably is a conservative estimate of the killing due to frost. Flax seeded in the roads at the ends of the plats germinated more promptly because of the firmer seed bed, and escaped serious damage from frost. Most of the plants were killed just at the surface of the ground, before they had a chance to come through.

The season in general is still about two weeks in advance of normal, in spite of the setback the latter part of April. Crops will soon be suffering from drought, however, unless we have rain soon.

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (April 30)

The precipitation recorded in April was 1.72 inches, which is 0.40 of an inch above average. Temperatures in the first half of the month were above average, while temperatures in the last half were below average.

All of the spring seeding in plats has been completed except the varietal flax and the last two dates of seeding in the spring grain rate-and-date-of-seeding test. The nursery oats, nearly all of the nursery barley, and about one-half of the nursery wheat has been sown. If nothing prevents it is hoped that the barley and flax nurseries may be seeded tomorrow.

There was considerable winterkilling of winter wheat under the Cereal Project, particularly of that sown with the ordinary drill. The wheat sown with the furrow drill is showing up much better. There is much favorable comment in this community this spring on the furrow method of seeding winter wheat. Possibly 50 per cent of the winter wheat acreage in the Judith Basin will be resown to spring wheat.

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (April 21)

The winter-wheat nursery sown last fall was completely winterkilled.

The greater portion of the spring nursery has been planted. Grains in the varietal plats have emerged and are doing nicely.

Intermittent rains have fallen in the last 10 days making conditions ideal for the germination of grains and small legume seeds.

The writer returned on March 24 from the University of California where he was engaged in graduate study in Genetics.

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell) (May 2)

Most of the comparative wheat varieties and hybrids are now fully headed. The growth of straw in wheat will be large this season and fortunately thus far there is very little lodging. Most of the varieties in the foreign wheat nursery have begun to head, while only a few of those in the wheat classification nursery, which was sown much later, have progressed as far.

The condition of the barley nurseries on the whole is poor. The heavy March rains caused the rank growth of young plants to lodge badly. There was only partial recovery from this condition, so that in many parts of the nursery the grain still is lodged with improper development of both grain and spike. The latest sown barley is in the best condition. The appearance of the replicated barley plats on the other hand is favorable.

The oat varieties in both plat and nursery are in various stages of heading and are making satisfactory progress.

The annual University Farm Picnic at Davis was held on April 25. This is a day when the Branch of the College of Agriculture is shown to the public. The main features of the day were the inspection of buildings and equipment, the Students' parade demonstrating some of the activities of the various Divisions, and the High School championship athletic contests. There were about 15,000 visitors.

Dr. A. G. Johnson, of the Office of Cereal Investigations, arrived at Berkeley on April 27 and visited Davis later in the week.

Agricultural Experiment Station, Berkeley (F. M. Briggs) (No report)

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Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 11

May 20, 1925
Personnel (May 11-20) and Field Station (May 1-15) Issue

PERSONNEL ITEMS

Miss Julia Etta Chute, clerk in cereal disease investigations since January 1, 1925, resigned her position at the termination of May 15, and was succeeded on May 16 by Mrs. Bessie W. Gahn who was transferred from the Office of Horticultural Investigations.

J. Allen Clark, agronomist in charge of western wheat investigations, will leave Washington on May 25 to inspect wheat experiments and study wheat varieties and hybrids in the breeding nurseries at various field stations in the western States.

T. R. Stanton, agronomist in charge of oat investigations, who left Washington on May 11, reports that throughout the Carolinas, Georgia and Alabama the almost unprecedented spring drought which has obtained since early April will greatly reduce the yield of fall-sown grains. In North Carolina the wheat crop probably will be reduced one-third. Some few fields of good oats were observed on the plantation and seed farms of the H. G. Hastings Seed Co., located about 15 miles north of Experiment, Ga. The 300 acres of Red Rustproof (Hastings' Hundred Bushel) probably will average about 45 bushels to the acre. Some excellent fields of fall-sown oats also were seen in south Georgia, just west of Tifton. Many fields of Red Rustproof oats contained a considerable mixture of other varieties. This is largely explained by the fact that good seed was difficult to obtain last fall because of an almost total loss of the crops in 1924 as the result of winterkilling. For this reason practically anything that could be found was used for seed.

Because of the dry weather there has been very little complaint of rust on any of the small grains.

In general, rye looked better than wheat and oats, except where varieties other than Abruzzes were being grown. There is considerable complaint against the practice of shipping northern-grown Rosen rye into the South for seed which usually can be bought for about one-half the price of native Abruzzes seed. Rosen apparently is poorly adapted and matures too late for successful culture in the South. One of the most interesting observations made in connection with rye was what appears to be a self-fertile strain which Mr. George J. Wiles has isolated in his selfing experiments with rye at Hartsville, S. C. Fully 80 to 90 per cent of the flowers are self-fertile. Mr. Wiles also has obtained dwarf ryes and a peculiar yellow-seeded sort. R. P. Bledsoe at Experiment, Ga., also is doing extensive selfing work with rye. This season he has bagged more than 2,500 plants. In general, Mr. Bledsoe has the largest cereal nursery in the South. In addition to rye he is growing many hundreds of strains of wheat and oats.

At Clemson College, S. C., fully 25 per cent of the plants of Success Hooded barley were infected with Helminthosporium.

Generally, early planted cotton is in fair to good condition. However, late planted cotton is very poor; many fields have not yet emerged because of the drought.

Dr. W. H. Tisdale, pathologist in charge of smut investigations, will leave Washington May 26 for a two-week's trip in Missouri, Illinois, Kansas and Texas in the interests of smut investigations. Notes will be taken on flag smut occurrence at Granite City, Ill., and St. Louis, Mo., and at Dalhart, Tex., experimental sorghum and smut nurseries will be sown. Doctor Tisdale will confer with officials of the Kansas Agricultural Experiment Station regarding smut investigations.

VISITORS

Sultan Mahmoud Amerie, Attaché of the Persian Legation, in this city, called at the Office May 14 to make arrangements for the purchase and transportation of several bushels each of four different varieties of wheat for growing in his native country.

J. B. Burrows, of Decatur, Ill., president of the Illinois State Horticultural Society and a prominent farmer, was an Office visitor on May 13.

MANUSCRIPTS AND PUBLICATIONS

38 A manuscript, entitled "Progress of Barberry Eradication in Nebraska," by A. F. Thiel, was submitted May 9 for publication as a circular of the Extension Service of the University of Nebraska Agricultural College, in cooperation with the Office of Cereal Investigations.

Galley proof of Department Bulletin 1341, entitled "Effects of Continuous Selection for Ear Type in Corn," by H. S. Garrison and Frederick D. Richey, was read May 18.

The article, entitled "Relative Susceptibility of Selections from a Fulghum-Swedish Select Cross to the Smuts of Oats," by George M. Reed and T. R. Stanton, appears in the Journal of Agricultural Research, vol. 30, no. 4, p. 375-391, 4 pl. Feb. 15, 1925. (Received from the Government Printing Office May 18, 1925)

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (May 14)

The extended period of cold and rainy weather checked the growth of the small grains. A month ago barley and rye were about 10 days ahead of growing schedule, but at present at least half of this earliness has been lost. The earlier wheats are now heading and within a week heading will be general in nearly all varieties. The prospects for yields are above average. Wheat has too much vegetative growth, and unless the weather conditions are unusually favorable lodging is expected.

The cold weather appears to have checked the spread of leaf rust of wheat and rye, as it is rarely seen in the plats. Loose smut is unusually prevalent in the wheat varieties that have already headed, though the percentage present is small. Pennsylvania No. 44, a variety which has shown merit in the varietal plats, is strikingly afflicted with a yellow spotting of the leaves, making the variety recognizable from all the wheats at this date. Barley is unusually free from the smuts, particularly covered smut. To some extent this is due to the seed treatment (Semesan), but even the untreated plats sown with seed naturally inoculated with covered smut exhibit in several instances little evidence of smutted heads.

The annual expression of natural crossing between wheat and rye may be seen in the earlier flowering wheat varieties. In one fortieth-acre plat, ten of these first generation hybrids were counted. There are also some excellent examples of the extent to which natural crossing between wheat sorts may occur.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig) (No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (May 14)

During the first half of May we have been having very cool and unseasonable weather unfavorable to the progress of farm work and to the growth of crops. Light frosts occurred three or four times in the first week of the month, and the day temperatures were mostly below 70° throughout the fortnight. The rainfall also was below normal.

As a result corn planting has been somewhat delayed, though the very favorable weather of April had resulted in the planting of a large proportion of the crop before May 1. In the last day or two the weather has been warmer and corn planting will now go forward rapidly to completion.

Apparently no damage has been done to the wheat crop, though growth has not been quite so rapid as usual at this period. In the southern part of the State heads are forming, and in this section the wheat generally is in the jointing stage.

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (No report)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (May 14)

A trip was made to Tazewell County on May 14 and the escaped area of Berberis canadensis near Pekin was examined for rust. The area had been treated with salt last fall and very few bushes could be found which were still alive. No rust could be found on the bushes. As this species of barberry was found to be susceptible to Puccinia graminis secalis in the greenhouse, an effort was made to locate some grains and grasses in the vicinity of the barberry susceptible to this form of rust. The barberries were growing in a wooded area and no grains or grasses were growing in that locality.

On May 14 a few barberry bushes growing at Lacon in Marshall County, were examined for rust. No infection could be found.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Mamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (May 16)

Weather conditions during the first part of May have been cool and moist. Sorghums sown on the second date (May 1) in the date-of-seeding experiments, emerged May 11, which indicates that the weather and soil were cool. The plats of the third date in these experiments were sown on May 15.

At present it appears that grasshoppers will be bad this season. The rains of April will enable wheat to fill well, but the heads developed under dry conditions and are short.

The writer has conducted some preliminary experiments with the chemical treatment of feterita seed to aid field germination. It usually is very difficult to get a stand early in the season and often later stands are not satisfactory. Four different chemicals used dry on seed were tried. Bulk feterita seed was treated with the different chemicals. The first test was in the greenhouse and seed germinator. Duplicate 100 seed samples were placed in the germinator and in a greenhouse bed on March 4. There was no appreciable difference in the germination of the seed in the germinator, the amount of mold on the samples varied, some of the treated samples being very clean. The 10 samples averaged 96.5 per cent germination at 6 days. The duplicated series on the bench averaged 63.5 per cent for copper carbonate, 23.0 per cent for copper stearate, 86.5 per cent for one mercury compound, 77.0 per cent for the second mercury compound, and 21.5 per cent germination for the check, or no treatment. On April 4, 100 seeds of each of the five lots were sown out of doors, the germination being as follows: Copper carbonate, 69 per cent, copper stearate, 64 per cent, Hg No. 1, 79 per cent, Hg No. 2, 89 per cent and check 66 per cent. In this test the soil was dry and sandy and had not been cropped for several years and probably was fairly free of bacterial and fungous contamination. On May 1 a field trial of the treatments was made; treated feterita and a check were drilled on a fairly damp field, the rows were duplicated with each side of the 2-row drill. Counts of plants were made at three places in the rows on May 12. Based on planter calibrations with same seed and plates the field germination for the various treatments averaged as follows: Copper carbonate, 39.08 per cent, copper stearate, 32.25 per cent, Hg. compd. No. 1, 44.94 per cent, Hg. compd. No. 2, 45.82 per cent, and check, no treatment, 26.24 per cent. The results are so favorable that the writer will treat feterita seed used in experimental plats this year, in fact the feterita seed used in the date-of-seeding experiment seeded May 1 was treated with mercury compound No. 1 and produced an excellent stand, as good as the milo beside it. If stands of feterita can be obtained whenever seeded during the planting season it will be a great aid in experimental work, and may prove to be of great value in obtaining stands of sorghums on farms. The above is submitted as information for experimenters who have had difficulty in obtaining stands of grain sorghums, particularly feterita, because of seed rotting in the soil.

Maximum temperature for first half of May, 89° on the 3rd and 15th; minimum, 46° on the 2nd. The precipitation for the same period was 1.20 inches in five showers.

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (May 16)

The weather for the first half of May has continued dry, and there is little reserve moisture in the subsoil. The rainfall for this period was 0.85 of an inch. Wheat, oats and barley have responded remarkably well to this limited amount of moisture, but rain is needed immediately if a fair crop is to be obtained. Wheat on fallow ground is in a more favorable condition.

Nebraska No. 28 is today fully headed, while the heads of Blackhull wheat are just emerging. The early selections of barley in both the nursery and varietal plats are also beginning to head.

All of the experimental seed for the sorghum nursery has been packeted and the ground made ready for seeding. The first seeding of the varietal sorghums was made today. The sorghum varietal experiment will include this year 48 varieties to be sown on three different dates. In addition, 40 other selections and strains of sorghum, many of which have been advanced from the nursery, will be included in a preliminary varietal experiment. Twelve of these selections contain promising material for a straight-necked milo, after four years of work.

Dr. Theodor Roemer and Joachim Deiche, two German scientists, were Station visitors on May 9.

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (May 15)

Crops are developing rapidly and there are indications of an early harvest. Rye on the rotation plats is heading out and winter wheat is well up into the boot. Both leaf and stem rust were found on May 13.

Corn planting was begun on May 11 and finished May 13.

Dean E. A. Burnett and Prof. E. E. Brackett were Station visitors this week.

Rains totaling 1.85 inches have been recorded for May.

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

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NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (May 14)

Cool weather has prevailed so far this month, with minimum temperatures below freezing nearly every morning up to May 10. A minimum of 20 degrees was reached on May 1. Apparently no serious damage has resulted to germinating flax or other cereal crops because of low temperatures. There has been hardly any rain so far this month, and the surface soil is becoming very dry.

Varieties of flax and proso were sown on May 12 and 13. The flaxwheat mixtures experiment was sown May 12. Corn varieties in field rows were planted May 13. It is expected that the corn nursery of about 430 rows will be planted May 15 and 16.

The seeding of small grain in this vicinity is nearly finished with the exception of flax. The planting of corn has begun.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (May 18)

The flax and cereal mixtures sown April 27, emerged about May 9 with good stands, and were apparently only slightly damaged by the freezing temperatures. The uniform rust nurseries of wheat and oats sown on April 30, emerged about May 11. Flax sown in the date-of-seeding-and-tillage-experiment May 1, emerged about May 10, with fair stands. There was apparently some reduction in stand due to the heavy frost on May 15. The frost injury was especially marked in the plowed plats, where the germination was delayed because of the looseness of the seed bed, compared with the disked plats. Flax was sown in the varietal plats on May 4, and was just emerging May 15, the date of the most severe frost. The frost injury was so severe that it may be necessary to reseed the flax varietal plats. The flax nurseries have not yet been sown. There has been so much trouble in previous years from irregular germination of flax that it seems desirable to postpone the seeding of the flax nurseries until there is sufficient rain to insure a good uniform germination. The third seeding in the date-of-seeding-and-tillage experiment was made May 15.

The weather of the last half of May has been generally dry and cold for this time of year. The total precipitation for this period was 0.43 of an inch, which fell in small showers on five different dates as follows: 0.02, May 2; 0.13, May 3; 0.04, May 4; 0.15, May 14; 0.09, May 15. The maximum temperature for the period was 79° on May 12; minimum, 23° on May 15. Freezing temperatures were recorded as follows: 28° May 5; 30° May 6; 25° May 7; 26° May 10; 23° May 15.

MONTANA

Judith Basin Substation, Moccasin (E. W. May) (May 16)

All of the spring grain under the cereal project has been sown except that for the last date of seeding in the date-of-seeding experiment. All of the grain has emerged except some of the last nursery seedings. The nursery this year is larger than ever before. It almost fills one belt or series, a block of land 37 x 8 rods in area.

All spring grain has emerged very slowly, making early seedings equal to medium-late seedings so far as growth and development are concerned. A few fields of spring wheat in the Judith Basin which were sown in the early part of April were reseeded because the weeds made more rapid growth than the wheat. Winter wheat has made fair growth.

The winter wheat sown with the furrow drill in the furrow-drill experiments is showing up much better than the wheat sown with the ordinary drill. Many visitors are coming long distances to see the test and all express surprise at the contrasts.

Temperatures in the latter part of April and the first two weeks of May were much lower than normal. A temperature of 19° on the morning of May 10 nipped the tips of the leaves of some grain. Even the tips of the leaves of some of the winter wheat were frosted. The maximum temperature recorded in the first two weeks of May was 70° on May 11. Only 0.33 of an inch of precipitation was recorded in the first half of May, as compared to 2.69 inches as the average for the whole month.

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (May 14)

Seeding of the cereal nursery for 1925 has been completed. Approximately 5,500 rows were sown. More than 120,000 seeds were spaced this year. A considerable portion of the nursery is devoted to smut investigations. It is hoped that immune barleys and oats can be developed that will be suitable for the irrigated lands of Idaho.

A recent rain of 0.62 of an inch has put the ground in excellent condition. Temperatures have been rather low this spring, and plants have not made much growth.

The prospects for irrigation water this season are excellent.

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (May 17)

Heavy rains during the first part of April delayed spring work in the rice fields for two weeks. As a result of the late seed-bed preparation, seeding of the crop is also about two weeks later than normal. Probably not more than one-half or two-thirds of the rice area is now sown and irrigated.

In general, the rice seed bed this year is probably rougher than usual. Part of the land was plowed too wet and some of it was plowed too dry to be reduced to a good seed bed. While seeding is only partly completed, it is estimated that there will be from 112,000 to 115,000 acres sown to rice in California this year, as compared with 90,000 acres in 1924.

The California paddy market retains its strength and No. 1 paddy is being sold at about $4.25 per hundred pounds.

We began plowing at the Station on April 23. The irrigation experiments were sown May 6 and 15 (date of seeding); the varietal plats were sown May 8 and 10; the fertilizer experiments May 9; and the nursery experiments May 14 to 16. The irrigation and fertilizer experiments were submerged, and the varietal and nursery experiments were flooded and drained immediately after sowing.

On May 8 the Farm Bureau Travel Conference of the California Extension Division, consisting of about 50 automobiles and 200 people, stopped at the Station for about 15 minutes. While here I gave them a brief outline of the Station work and of the results of our fertilizer experiments.

Last year, in cooperation with the county agent, we had a few demonstration fields on which ammonium sulphate was applied at the rate of 100 pounds per acre. These fields were visited by about 50 growers early in September, and the increased growth was quite noticeable in each case. As a result of these demonstrations, enough ammonium sulphate has been sold this year to fertilize about 1,300 acres in Butte County.

On May 16 Prof. G. W. Hendry, J. P. Conrad and Charles West, accompanied by about 30 travel students of the University of California, visited the Station. The travel course includes a study of the important field crops and soils in California.

University Farm, Davis (W. H. Florell) (May 15)

The outlook for the harvest of the cereal experiments is not so promising as it was about a week or ten days ago. The vegetative growth, particularly of wheat and oats, is very large this season and at that time varieties of wheat such as White Australian and Baart stood about six feet high. On May 12 and 13 there was a rainstorm, and a precipitation of 1.14 inches was recorded. Although the storm was accompanied with but very little wind, there was very severe lodging of all grains. Even strains which had been selected for resistance to lodging seemed to be about as flat as any of them. The Federation varieties which had begun to ripen and normally are short and stiff-straved withstood the storm fairly well. In general the late maturing varieties are pretty well down. Since the rain the weather has been fair with moderate winds and the grain is straightening out somewhat. However, the labor required in harvesting will be much greater.

The rusts of both wheat and oats are developing rapidly, and if the weather continues more or less moist an epidemic may be expected.

In general, California will be greatly benefited by the late rain. It will mean more abundant feed for stockmen and also will benefit orchards and late sown grain. The chief injury perhaps was done to the hay crop and the cherry crop. Hundreds of acres of oat hay were cut and in the shock and it is reported that a considerable percentage of ripe cherries on the trees are cracked or burst open. The early sown fields of commercial grain are pretty badly lodged, but there is reason to believe that it will be possible to harvest the crop successfully.

Agricultural Experiment Station, Berkeley (F. M. Briggs) (No report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 12

June 1, 1925
Personnel (May 21-June 1) and Project Issue

PERSONNEL ITEMS

Dr. C. R. Ball, on May 20, installed a chapter of the honor society of Phi Kappa Phi at historic old William and Mary College, founded in 1693 at Williamsburg, Va. For 225 years it was a college for men only. Five years ago it became a State-supported college and was opened to women, who now comprise about one-half of the 1,200 students.

On May 22, a chapter of this honor society was installed by Doctor Ball at the Florida State College for Women at Tallahassee, an institution only 20 years old but now having about 800 students in the four-year courses, besides a large summer school. It is significant that the impetus for establishing a chapter there came from the senior students themselves, although the petition for the chapter can come only from faculty members.

Phi Kappa Phi is the only honor society which recognizes all departments of the college and all colleges of the university. It stands for high scholarship and character and secondarily for unity and democracy in education.

J. Allen Clark, agronomist in charge of western wheat investigations, reported on May 30 that the winter wheat varieties and hybrids in plats and nursery at the Kansas Agricultural Experiment Station, Manhattan, were fully headed and give promise of a very good crop in spite of the dry season. Earliness in wheat appears to be of great importance in Kansas this season. In Professor Parker's breeding nursery marked earliness has been obtained in hybrid selections from Kanred X Hard Federation, Kanred X Prelude, and Kanred X Nebraska No. 28. Many strains of these hybrids headed eight to ten days earlier than Kanred. The earliest strains of Marquis X Kanred headed only two to three days earlier than Kanred.

On May 28 Mr. Clark motored from Manhattan to Hays with Professors Salmon and McColloch, the latter the Station entomologist. The indications are not favorable for a good wheat crop in Kansas, and the same may be said of the wheat fields viewed from the train in passing through Ohio, Indiana, and Illinois. The damage is principally the result of drought, winterkilling, and Hessian fly. The latter is bad all over Kansas and worse than it has been for many years.

Wheat production in Kansas probably will be between 50 and 75 million bushels, or one-third to one-half of a crop.

The experiments at Hays, Kans., were in excellent condition, with the exception of the series on cropped land which are nearly a failure because of drought, while the experiments on fallow give promise of yielding 20 to 30 bushels to the acre. The soil moisture is almost exhausted, however, and rain is needed for the further development of the crop.

Dr. A. G. Johnson, senior pathologist in charge of the investigations of diseases caused by imperfect and sac fungi, returned to Washington May 23. His entire trip was highly satisfactory. Experimental work at the different points was found to be progressing satisfactorily.

At Lincolnton, N. C., take-all was found to be recurring with considerable virulence in the experimental plats. At San Antonio, Tex., very few cereal diseases were noted on account of the extremely dry conditions that prevailed there, no rain having occurred since the early part of last December. No diseases were found on flax, but a limited amount of stripe disease was noted in certain varieties of barley.

At Davis, Calif., the most conspicuous cereal disease was the barley scald. As in previous years, certain varieties of barley were showing rather promising resistance to this disease; certain of Professor Mackie's hybrid barleys seemed especially promising in this respect. These also seemed especially promising in their ability to withstand the tendency to lodge. Certain of the Helminthosporium diseases also were conspicuous on some of the barley varieties.

Barley scald also was found to be abundant on some of the barleys at Corvallis, Oreg. At Pullman, Wash., and Moscow, Idaho, the experimental plats were in excellent condition, but the diseases were not as yet conspicuous. At the latter point, however, stripe rust was beginning to appear on certain of the grasses in the grass garden.

At Fargo, N. Dak., the season has been rather backward and but few of the flax experimental plats had been sown. At Brookings, S. Dak., the most outstanding thing noted on the cereals was the injury from the frost which occurred on the evening of May 16. Rather severe injury was noted on the various cereals, including wheat, oats, barley, rye and flax, especially the flax which showed only the cotyledonary leaves. The early sown flax which showed from 10 to 16 true leaves had withstood the frost apparently almost without injury.

At Madison, Wis., the experimental plats were in excellent condition and the stripe disease of barley was beginning to become evident.

In Indiana and Illinois corn had been planted in the experimental plats, but only the earlier plantings had emerged. Corn was well up in a number of commercial fields of Illinois and Indiana and in one case near La Fayette a farmer had begun to plow his corn. La Fayette was visited on May 22.

Oliver C. Lee, of Montana, has been given a three-months' appointment, effective June 1, to assist R. W. May in charge of the cooperative cereal experiments at the Judith Basin Substation, Bozeman, Mont.

F. D. Richey, agronomist in charge of corn investigations, reports that most of the experimental corn was planted at Arlington Farm during the period from May 11 to 23. There yet remain to be planted some early maturing varieties to be used in making crosses. The total area planted in experimental corn is 9.7 acres. The majorportion of this area is occupied by the breeding and genetic work of the several men of the Office with headquarters in Washington. In this area are planted 214 foreign varieties, most of which were collected by Messrs. Richey and Emerson in South America. There also are 53 varieties received from Mr. Thomas Bregger, special corn expert of Argentina. This is the beginning of a cooperative attempt to produce two crops of corn in one year, the alternate crop to be produced in Argentina.

The weather following much of the planting at Arlington Farm was unfavorable to corn growing so that a rather poor stand was obtained, particularly with the selfed lines. This has necessitated some replanting which is being done now. Rain is needed immediately. However, no material damage has been done so far.

Dr. Charles E. Saunders, originator of Marquis wheat, was honored yesterday by the Royal Society of Canada by being made the first recipient of the gold medal offered by the society by Sir Joseph Flavelle for special scientific achievement. The medal was presented by the president, Dr. J. C. McLennan of Toronto, who said that Doctor Saunders was one of the greatest men Canada ever had, and well merited the honor conferred upon him. (The Christian Science Monitor, May 26, 1925)

MANUSCRIPTS AND PUBLICATIONS

39 A brief paper, entitled "The Losse Smut of Rye (Ustilago tritici)," by H. B. Humphrey and V. F. Tapke, was approved May 28 for publication in Phytopathology.

Galley proof of Department Circular 353, entitled "Improved Oat Varieties for New York and Adjacent States," by H. H. Love, T. R. Stanton and W. T. Craig, was read May 22.

Galley proof of article, entitled "Corn Judging and the Productiveness of Corn," by Frederick D. Richey, for publication in the Journal of the American Society of Agronomy, was read May 23.

A 43-page article, entitled "Some Elements of Successful Cooperation in Research," by Carleton R. Ball, was received in mimeographed form May 20. The Appendix comprises 17 pages and the bibliography three pages. This was an address delivered by Doctor Ball before the Special Conference of Directors of State Agricultural Experiment Stations at St. Louis, Mo., April 20, 1925.

NOTICE

The annual meeting of the Western Branch of the American Society of Agronomy will be held at Fort Collins, Colo., Thursday, Friday and Saturday, June 18-20, Prof. Alvin Kezer, professor of agronomy, State Agricultural College of Colorado and the Agricultural Experiment Station, will be in charge of the meetings.

The sixth annual meeting of the Southwestern Division of the American Association for the Advancement of Science will be held at Boulder, Colo., June 8 to 11, 1925.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 13

June 10, 1925
Personnel (June 1-10) and Field Station (May 16-31) Issue

PERSONNEL ITEMS

Dr. A. G. Johnson, senior pathologist in charge of the investigations of diseases caused by imperfect and sac fungi, will leave June 9 for Lincolnton, N. C., to inspect cooperative wheat plats in connection with experiments to control the take-all diseases. He will return about June 16.

Dr. F. E. Kempton, associate pathologist in charge of barberry eradication, wrote from Bozeman, Mont., on May 28 of his return to the barberry-eradication area to meet groups of field men in each of the States through which he will pass on his way back to Washington, where he expects to arrive either June 12 or 13.

Dr. E. B. Mains, agent in the cooperative cereal-disease investigations conducted at Purdue University Agricultural Experiment Station, has been authorized to proceed from La Fayette, Ind., to Washington, D. C., to take notes on the leaf-rust nursery at Arlington Experiment Farm and to confer with the agronomist in charge of eastern wheat investigations with reference to plans for the continuation of leaf-rust resistance research.

John H. Martin, associate agronomist in western wheat investigations, left Washington, June 9 for Manhattan, Hays, and Colby, Kansas, to inspect the cooperative wheat experiments in plats and nurseries. He also will visit points in Colorado, Wyoming, Utah, Nebraska, Idaho and Oregon for the same purpose and to study the condition of cereals in general and confer with officials of State agricultural experiment stations.

Merritt N. Pope, associate agronomist in barley investigations, will leave Washington on June 11 for points in Kansas, Colorado, and Idaho to study cooperative barley experiments in plats and nurseries and to confer with officials of the State agricultural experiment stations.

T. R. Stanton, agronomist in charge of oat investigations, returned to Washington June 6 after an extended field trip through the southern and southwestern States in the interest of oat investigations. He reports that the drought which has prevailed generally in the States east of the Mississippi is even more serious in the southwestern States. In Louisiana the oat crop is in fair condition. Some very good strains of the Patterson oat (a strain of Red Rustproof) were observed on the experiment farm at Baton Rouge.

In central Texas the drought has seriously injured all crops. Corn appears to be burned to the stage from which recovery apparently will be impossible even with the heaviest precipitation. However, in northern Texas and Oklahoma, recent rains have been very beneficial to crops in general. It appears that in these States crop conditions are somewhat spotted; but in general they are in poor condition, owing to the unusually dry winter and spring.

In Oklahoma many fields of wheat looked as though they would not make more than 6 to 8 bushels to the acre. In northeastern Oklahoma it was reported that many fields were being plowed and others cut for hay. Oats in this section probably will average from 20 to 30 bushels to the acre.

In general, Red Rustproof and Fulghum oats in Texas and Oklahoma are badly infected with smut. Many fields looked as though the infection might run as high as 25 per cent. This unusually high smut infection apparently has resulted from the peculiar dry winter and spring. In fact, the writer never has observed a heavier smut infection in such susceptible varieties as Aurora and Early Champion of the Avena sativa group. In Texas, fall-sown oats showed a decidedly lower infection than those sown in February. In Arkansas, Tennessee and Virginia, complaint of drought also was widespread. Winter wheat in these States is in fair condition, however, and some good yields will be produced. Fall-sown oats had been severely injured by winterkilling, and the spring-sown crop was suffering from the dry weather and was heading exceedingly short.

Cotton in general is small, but stands are quite regular. In the event of warm weather and some rain, a fair crop is in prospect. Owing to the dry spring there was little complaint of the boll weevil.

V. F. Tapke, associate pathologist in smut investigations, has been authorized to proceed from Ithaca, N. Y., to Washington, D. C., to discuss with the pathologist in charge the present status of smut investigations, to assist in formulating plans for future experiments, and to inspect the experiments now being conducted at the Arlington Experiment Farm. On the completion of these duties Mr. Tapke will return to Ithaca, N. Y., to resume cooperative investigations on the loose smuts of cereals and his graduate studies at Cornell University.

VISITORS

H. J. C. Umberger, dean and director of the Division of Extension, Kansas State Agricultural College, Manhattan, Kans., was an Office visitor June 2.

MANUSCRIPTS AND PUBLICATIONS

40 A manuscript, entitled "Infection of Corn Seedlings by Smut (Ustilago zeae) in the Greenhouse: Its Value in Studying Smut Resistance," by W. H. Tisdale and C. O. Johnston, was submitted June 10 for publication in the Journal of Agricultural Research.

Galley proof of Department Bulletin 1343, entitled "Improved Oat Varieties for the Corn Belt," by L. C. Burnett, T. R. Stanton, and C. W. Warburton, was read June 9.

Page proof of Department Bulletin 1284, entitled "Sorghum Smuts and Varietal Resistance in Sorghums," by Leo E. Melchers and George M. Reed, was read June 9.

The article, entitled "Certain Aspects of the Virus Diseases," by H. H. McKinney, appears in Phytopathology, vol. 15, no. 4, p. 189-202. April, 1925. Literature cited, p. 200-202. (Received June 8, 1925)

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (No report)

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig) (No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (June 2)

The total precipitation for the five months from January to May, inclusive, was 14.66 inches. This is 5.92 inches less than the average for the past 15 years for the same period, and 2.44 inches less than the precipitation for the same period last year. During the month of May the total precipitation was only 1.51 inches.

Unless heavy rains occur in June, a large part of the rice crop will be severely damaged, if not totally lost. On account of light rainfall during the winter months ideal conditions prevailed over most of the rice belt for seeding in February and March. As the weather continued favorable throughout the early spring, seeding was almost finished four to six weeks earlier than usual. Early seeding forced early irrigation. In many instances irrigation water was applied in April to promote germination. This early irrigation greatly reduced the supply of water before the usual time for submerging fields. If rice had been sown in April and May instead of February and March, rains in May would, in most cases, have supplied sufficient moisture for germination without artificial irrigation, for rice germinates very quickly in a well prepared seed bed when the weather is warm in May. Later sowing, therefore, would have saved water for the first part of the irrigation season.

The water level in the deep wells has fallen rapidly this spring. As early as May 12 the water in the Station well had dropped to a point below the pump.

On May 23 all seeding operations at the Station were completed, including rice and soybeans. Rice sown on May 18 to 20 is germinating slowly due to the rapid drying out of the soil caused by recent cold north winds. A good rain is now needed to produce quick growth in the young plants.

The salinity of the water in the fresh water streams in southwestern Louisiana has greatly increased since April 24. The determination of salt in the water of some of these streams was made on May 25 by E. C. Landry. The results are given below:

Streams	Samples Taken at Depth of-- (feet)	Salt per Gallon (grains)
Mermentau River (At Mermentau)	5	157
	15	225
	30	275
Mermentau River (At Lake Arthur Ferry)	5	195
	15	270
	19	280
Mermentau River (2 miles north of Mermentau)	15	231
Mermentau River (2 miles south of Mermentau)	15	230
Bayou Queue de Tortue (At Riceville Bridge)	10	48
Bayou Nez Peque (1/2 mile from Mermentau River)	15	223
Bayoue Plaquemine (1/2 mile from Mermentau River)	15	220
Bayou des Cannes (1/2 mile from Mermentau River)	15	217
Lake Arthur (At wharf)	4	229

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (June 1)

All of the corn-breeding experiments are now planted. Several different plantings were made in order to extend the flowering season and make it possible to secure more hand pollinations. The first planting was made on May 2 and the last on May 29.

This year's breeding experiments include the following progenies:

Program of selection within self-fertilized lines	1,886 progenies
Preliminary crossing-block of good inbreds	80 "
Genetic studies	569 "
Total	2,535 progenies

Most of the progenies included in the experiments on selection within self-fertilized lines have now been inbred three years. The 80 inbreds included in the preliminary crossing-block were selected from the most promising rows in last year's experiments. An effort will be made to secure about 500 combinations among these lines for testing next year. The genetic material includes inheritance and linkage studies with various chlorophyll and plant characters.

The season at Ames has been so dry so far this spring that the corn is not looking so well as usual. The stand is very uneven in the breeding experiments planted early, due mostly to lack of moisture. The heavy frost of May 25 did not hurt the corn much here though it did considerable damage in other parts of the State.

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (May 18)

On May 11, Frank Frolik reported that leaf rust was abundant on wheat in the vicinity of Belleville. On May 8 and 9, traveling from Decatur south to Belleville, he found a trace of leaf rust on wheat just south of Springfield and continued to find more the farther south he went.

John H. Seward found a trace infection of leaf rust on wheat near Monticello in Piatt County on May 12. On the 15th, in the same locality, he found a field of rye heavily infected with leaf rust.

On May 14 I found a field of infected rye near Hopedale in Tazewell County. The rye was headed out and at least three feet high. The infection was heavy on all the lower leaves.

On May 17 I found a trace infection of leaf rust on wheat near Champaign, Champaign County.

To date no leaf rust on grain has been reported in the northern part of Illinois.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Loer) [May 25]

Barberries were infected unusually early this spring. On May 5 the scouts found seedlings and sprouts heavily rusted near Wolcottville in La-Grange County (about 20 miles south of the Indiana-Michigan State line). The cluster cups were ready to open when found. On May 15 barberries were found heavily rusted at three different locations in Washington County (about 40 miles north of the Ohio River). The cluster cups were open and shedding spores. No stem rust was found on wheat in the adjoining fields on this date. Washington is one of the southern counties in Indiana and it will be interesting to note the spread of stem rust from these bushes. Mr. James B. Baker, the owner of the farm where the bushes were found, stated that his wheat usually was infected with stem rust and occasionally a whole field was ruined with the rust. This year his wheat field is within ten rods of several heavily rusted bushes. Rusted bushes also were found in Madison County on May 12.

Four scouts started operations on the Wolcottville area of escapes on May 4. Thousands of seedlings and sprouts were found in the original area. After the original area had been covered the surrounding territory was scouted. Nearly 100 large bushes have been found just beyond the old boundary line showing clearly that the outer limits of the area were not reached when it was first scouted. Additional scouting will be necessary before the outer limits are reached. This probably is true of most of the areas of escapes in Indiana.

Results of Stem-Rust Overwintering Studies in Indiana

In the fall of 1924 overwintering plats were established at La Fayette, Logansport, Shelbyville, Salem and Princeton. In each of these plats wheat was inoculated with stem rust in October. Ten six-inch flower pots containing wheat also were transplanted to these plats. Wheat had been planted in the pots early in October, then inoculated in the greenhouse and held there until rust pustules appeared before transplanting to the various locations.

The plat at La Fayette was inoculated early in October and a heavy infection soon developed. In connection with this plat, several flats were planted to wheat, inoculated, and placed outside. Flats were brought into the greenhouse every two weeks beginning November 18. Pustules appeared each time in about 10 days up until December 29, when pustules failed to appear. After that date no pustules developed when flats were brought in the greenhouse. The plat has been inspected several times this spring but no signs of stem rust have been found.

The plat at Logansport was inoculated October 6. A heavy infection was found when the plat was visited October 30. The plot was inspected May 22, but there were no signs of stem rust. A trace of leaf rust was found in the field. The pots of transplanted wheat all lived through the winter.

The plat at Shelbyville was inoculated October 14. A good infection was obtained. It was inspected on May 13. There was no evidence of stem rust overwintering. All the pots of transplanted wheat lived through the winter. No leaf rust was found in the field.

The plat at Salem was inoculated October 15 and a heavy fall infection resulted. An inspection was made May 14. No signs of stem rust could be found. All the transplanted wheat lived through the winter. A rather heavy infection of leaf rust was found. Nearly every plant had at least one pustule of leaf rust and an occasional leaf was covered with rust.

The plat at Princeton was inoculated October 23 and a heavy fall infection resulted. The plat was inspected April 28. There were no signs of stem rust. All the transplanted wheat lived through the winter. A few pustules of leaf rust were found.

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (May 31)

On April 29, B. Y. Morrison, in charge of the Berberis Garden of the Office of Seed and Plant Introduction, located at Bell, Maryland, came to Cincinnati to identify the various kinds of barberries in the city parks. For many years the officials of the Cincinnati Park Board have followed the policy of attempting to obtain, for their park plantings, as many species of plants as possible. The Ohio State Barberry quarantine outlaws only Berberis vulgaris and all of its horticultural varieties. Naturally a question arose as to the identity of the Cincinnati park barberries and the destruction of species which were known to be susceptible to rust, other than Berberis vulgaris. Mr. Morrison found that the plantings consisted of B. diaphana, B. vulgaris, B. sinensis, B. regeliana, B. antoensis and B. amruensis. During the period of inspection infection was found on B. amruensis in one of the parks; it was the first time that rust had been found on any of the barberries in the Cincinnati parks. The Park Board officials finally agreed to remove all of the barberries in their parks excepting B. thunbergii.

During May the intensive "every woodlot scouting method" was continued in Portage County. Six Federal agents and two State inspectors covered 35 per cent of the county during the month. Eighty rural locations and 16 city plantings were found; 58 of the rural plantings found were escapes. So far this is the banner county for numbers of escaped locations in Ohio and the county is about 60 per cent completed. It is hoped that the county will be finished by July 1.

Arrangements have been made for the exposure of spore traps via areoplane in June at McCook Field, Dayton. One trap is to be exposed during flights one-half hour, on each day possible between June 1 and June 30.

Rust infection on barberries became quite general in various parts of the State in the last part of April and the first half of May. However, heavy infection on barberries has been noted in only a few places so far this spring. Between May 16 and May 23 the writer made an extensive trip through central and western Ohio, inspecting grain fields to discover the presence of uredinia. Grain near, and at some distance from, infected barberries was observed. A moderate amount of leaf rust was found on rye and a trace on wheat. That on the rye was confined principally to the old leaves near the base of the plants, indicating that it probably had overwintered on or within the leaves. No uredinia of stem rust was found on grain even near infected barberries. The weather has not been favorable for the spread of rust from barberries to grain, that is, there has not been sufficient rain.

Heavy uredinial infection of stem rust on timothy was found May 26 on the edge of a wheat field in southwestern Mantua Township in Portage County.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (May 28)

Much time has been spent in the endeavor to locate early barberry infections. As early as April 25 infection on bushes was found in St. Joseph County. The spring season was exceptionally early and this date represents the earliest finding of stem rust in Michigan; stem rust was not found in 1924 until May 26.

Seven locations were made in St. Joseph County, each containing bushes moderately infected. These bushes and the surrounding susceptible grasses have been inspected daily since April 25, but up to the present time a spread of the rust has not been found. Spring arrived early, but it did not continue in a gracious mood. It has been rather cold and exceptionally dry.

Immediately after finding the rust in St. Joseph County, careful search was made for infected bushes in Ingham, Saginaw, Bay and Tuscola counties. These counties are several tiers north of St. Joseph. Infection was not found in Bay and Tuscola until May 22. The bushes were in excellent locations for early attacks, but the dry weather seemed to delay the appearance of the infections.

Second survey has been conducted in St. Joseph County. The St. Joseph River meanders through this section and its banks, from its source to its mouth, have supported many escaped bushes. Naturally, the second survey has been very intensive. Many bushes have been found in the most out-of-the-way or unexpected places. It is very evident that this phase of the campaign is of prime importance.

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt) (May 26)

We have made an extensive seeding in the spring-wheat nursery this year. The number of selections grown and the space used are approximately twice those of any previous year. About 4,000 varieties and individual plant-row selections are being grown under an artificial epidemic of stem rust. A large number of these, having 50 seeds or more, are being grown in duplicate from a late seeding. The epidemic is being produced by transplanting artificial cultures to the field from the greenhouse and by spraying with a water suspension of urediniospores. Approximately 14 physiologic forms which have been found in the spring-wheat area are being used in producing the field epidemic.

Over 2,000 individual plant rows are being grown under normal conditions (no artificial epidemic). These are duplicates of the selections grown under the artificial epidemic.

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (June 1)

The weather of the last half of May was warm and very dry. Growing conditions are becoming worse because of lack of moisture; wheat is ripening fast. In some parts of the country there will be an average wheat crop, but in others it will fall low.

Sorghum in the third date-of-seeding experiment emerged by May 21. The fourth date was seeded today. The rate-of-seeding plats of kafir, Sunrise (C. I. No. 472), and Reed's Blackhull (C. I. No. 628) were seeded on May 21 and had emerged by the 27th. As usual, this region is in need of a gentle one to two-inch rain.

Maximum temperature for last half of May, 100° on May 21; minimum 47° on the 25th. Precipitation for the last half of May, 0.14 of an inch, in four showers; total precipitation for May, 1.34 inches.

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (June 2)

Oats, barley, and spring wheat have headed at heights of from 6 to 12 inches depending upon the variety. Corn and sorghums which were seeded on well prepared land where the limited moisture has been conserved have germinated well and are making good growth.

The 50-year average rainfall for the month of May at Hays is 3.28 inches. The rainfall for the month of May this year was 1.01 inches and is the fifth driest on record. The weather still continues windy and dry.

Because of the drought all small grain crops are suffering. Crops on fallow land have some chance of making a fair yield, but grains on cropped land can be helped but little, even with immediate rains.

The Hessian fly is present in all wheat fields in this section. The second spring brood of flies has emerged. Traces of straw worms also are present.

The fallow land on which pure seed will be grown for next year is now being plowed. The sorghums and corn on the cereal project are being cultivated for the first time to-day.

The barley and oats nurseries on the cereal project are showing some interesting differences. About 75 per cent of the 290 new importations of barley obtained by Dr. H. V. Harlan are from two to four days earlier than Club Mariout, used as a check, and one of the most promising barleys at this Station up to the present time. Many of the new importations have the general appearance of the Club Mariout. For this reason they may prove of value under Kansas conditions.

J. Allen Clark, Agronomist in charge of western wheat investigations, and Profs. S. C. Salmon and J. W. McColloch, entomologist of the Kansas State Agricultural College, were Station visitors May 29.

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (June 1)

The weather of the period ending May 31 was hot and dry, the maximum temperature being 95° and the minimum 39°. A precipitation totaling 0.13 of an inch was recorded.

Corn is growing rapidly. Winter wheat is again suffering from drought. Some plats are badly burned, others are showing the effects of the drought.

Winter wheat is well in head. The majority of the barley and oats varietal plats are headed out. Of the spring wheats, Prelude, Hard Federation, Quality, and Ruby are showing heads.

Sorghum varieties are just emerging. This is the first time in several years when beating rains have not followed the seeding of sorghums.

On May 26 approximately 400 farmers from Dawson County visited the Station and inspected all the experiments.

Dean E. A. Burnett and Prof. W. W. Burr were visitors at the Station on May 25.

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) (No report)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) [May 21]

Planting of the corn nursery was finished last Saturday, May 16. There are 440 rows this year. It was thought that there would be about 500, but the number of sterile cobs was larger than expected. It is fortunate that no corn was up by May 16, as we had the hardest freeze that morning that I have seen in this State in the month of May for 23 years. With a minimum of 20 degrees the wheat, oats, and barley were frosted enough to set them back a week or more, while flax in the 2-leaf stage was nearly all killed. Our corn varieties in the field were planted a few days before the freeze but were not yet up.

The prospect to-day is that the season may be warm enough for corn. It is 95 in the shade this afternoon.

(May 29)

The seeding of cereal crops is ended for this season, with the exception of flax in the date-of-seeding and tillage experiment. The total number of seedings in the cereal projects for the year is as follows:

Field plats	515
Nursery rows	3,350
Field varieties and strains of corn	25
Ear rows of corn	440

The cereal nursery has been cultivated. The roadways in the plats have been cultivated and plats trimmed. The corn in field and nursery has been harrowed.

The temperatures during May have been quite changeable, with a maximum of 95 degrees on May 21 and a minimum of 20 degrees on May 1 and May 16. The low temperature on May 16, followed by several days of hot sunshine, caused the most severe damage to cereal crops from freezing that the writer has observed during 24 years in the State. In spring wheat, oats, and barley many of the leaves wilted. In spring wheat the percentage of leaves so affected varied from 25 to 75 per cent. At the Substation the percentage was nearer the lower figure. Most of the plants are recovering; possibly 10 per cent of the plants in the three crops mentioned have died, while the rest are recovering after a rain of about 0.75 of an inch which occurred about a week after the frost. Farmers estimate losses as high as 50 per cent in some places as a result of the freeze and subsequent hot, dry weather. The greatest injury occurred on low land where freezing was more severe and on sandy fields where the drought was most injurious.

Flax in the 2-leaf stage showed from 60 to 95 per cent killing, while that an inch or more in height showed as high as 40 per cent in some plats. The flax varieties had not yet emerged and so escaped injury. The greater part of the flax in this section escaped injury for the same reason.

All varieties of spring wheat, oats, and barley were injured by the frost but the following varieties showed greater injury than the rest:

Spring wheat	Oats	Barley
Hard Federation	Corriente	Hannchen
Nohola	Banner	Chile
Progress	Victory	Club Mariout
Marquis x Iumillo	Big Four	Flynn
N. D. R. 74	Siberian	
	Swedish Select	
	Lincoln	

The total precipitation for the month of May up to the present time has been 0.89 of an inch, which is about 1.50 inches below normal for the month. A good rain is needed, especially for the winter wheat and rye. The latter is heading low as a result of dry weather.

The Substation was visited recently by C. N. Ainslie, Government entomologist from Sioux City, Iowa, who is investigating the Hessian fly in this vicinity. A few eggs of this insect were found on spring wheat near the place where the flies had wintered in the pupa stage and emerged this spring.

(June 1)

About an inch of rain fell last night and the crop prospects are much improved.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.)
(June 4)

The weather of the last half of May has been characterized by extreme temperatures and low precipitation. Temperatures have been alternately disagreeably cold and excessively hot. Maximum temperature for the period was 97 degrees on May 31; minimum, 27 degrees on May 16; precipitation 0.75 of an inch.

In the flax varietal plats sown May 4 there has been some improvement in the stands, due to belated germination, since the heavy frost injury on May 15. The stands are very poor, however, compared with those of the flax and cereal mixtures sown April 27 and the date-of-seeding plats sown May 1.

The last of the wheat nursery seed, received May 22 from Bozeman, was sown May 22 and 23. Showers of very cold rain on both dates made it very unpleasant for hand seeding but resulted in a good prompt germination about May 30.

The showers on May 22, 23, 25 and 26 amounted to 0.57 of an inch. Advantage was taken of this moisture to sow the regular flax nursery seedings on flax-sick soil May 26, 27 and 28. Flax sown May 26 began to emerge about June 1. That sown on May 27 and 28 is a little slower in germinating but is coming up now.

The fourth seeding of the date-of-seeding-and-tillage experiment was made June 1.

The miscellaneous selection and hybrid material was sown on flax-sick soil June 2.

The new breaking prepared for the flax nursery on uninfected soil is very dry, so that seeding seems inadvisable at this time. The land has been cultivated twice to destroy weed growth, and was re-marked ready for seeding as soon as there is sufficient rain to insure a good, even germination.

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (June 1)

Only 1.15 inches of precipitation was recorded in May. In only one year since the Substation was established in 1908 was the precipitation recorded in May less than that of last month. This was in 1919 when the May precipitation was only 0.73 of an inch. The average precipitation in May is 2.69 inches.

Though the precipitation in May was much below average, crops look remarkably well. This has been partly because of temperatures lower than normal and partly because of the absence of strong winds. Winter rye and alfalfa are the only crops showing much injury from lack of moisture. Winter wheat continues vigorous growth, but without more rain soon, it too will begin to suffer. Two-thirds of the precipitation recorded in May fell in the last week of the month. This greatly increases the prospects of the winter wheat and spring grains. Winter rye is beginning to head, while winter wheat is about 8 or 10 inches high. The early-sown spring grains are about 5 or 6 inches high. The winter rye is heading very short.

T. W. Moseley, in charge of experiments in dairying at the Huntley (Mont.) Field Station, was a recent visitor at the Substation.

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (No report)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (May 27)

Crop conditions throughout eastern Oregon have greatly improved during the last two weeks because of the unusually heavy rainfall in the week of May 17. In the five days from May 17 to 21, 2.01 inches of rain fell at Moro. Spring grains, some of which were beginning to head, were greatly benefited. The early sown, early-maturing varieties undoubtedly will produce fair yields with no further precipitation.

On the Station plats, Mariout barley is about 50 per cent headed and Hard Federation and a few other wheat varieties are beginning to head. The winter wheat sown in January and early February is now growing rapidly but it probably will not yield so well as spring wheat unless moisture conditions continue favorable. The Turkey varieties will be from ten days to two weeks later in heading than Hard Federation spring wheat.

Moderate temperatures prevailed during May. April, however, was an unusually warm month. There were two days with maximum temperatures of 81 degrees,--two degrees higher than any previous temperature recorded in April.

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (June 1)

The weather during the last half of May has been cold and cloudy, and therefore unfavorable for germination and growth of rice. Rice sown broadcast and continuously submerged thereafter is slower than usual in emerging, but rice which is drilled, then flooded and drained, is emerging in about the usual length of time.

Because of seepage through new levees and lack of drainage, we were unable to get a stand for 17 varieties of rice which were sown with a drill on May 9, so we broadcasted the same varieties on the same plats on May 25 and are holding the water on them. This will give us some information regarding the behavior of different varieties when grown by continuous submergence, and such data will be of considerable interest.

All varieties except those sown broadcast, the nursery, and most of the plats continuously submerged in the irrigation and fertilizer experiments, have now emerged.

The maximum temperature for May was 94° on the 26th, and the minimum, 40° on May 8.

University Farm, Davis (V. H. Florell) (June 1)

On May 23 to 25 the writer took an automobile trip in the Sacramento Valley to note the condition of the grain crops. It was found that the vegetative growth of the cereals is larger in the vicinity of Davis, with much more lodging than in the upper valley. It appears that the weather during the winter has been somewhat colder away from the Bay, resulting in the smaller vegetative growth. Reduction in the amount of lodged grain was noted to begin about 25 miles north of Davis. In the upper valley much more winter grain was sown than in this vicinity, which accounts in part for the shorter growth of straw and lack of lodging.

On the whole, however, the condition of the grain is unusually good. A number of fine wheat fields were observed on the adobe land in the vicinity of Biggs. Early Baart appears to be the most popular variety of wheat on this type of land, although some Hard Federation also is grown and is doing well. This is a "Hard Federation season" in the Sacramento Valley, as it appears to be among the most promising of all the varieties. The Federation wheats are beginning to be grown quite widely in Butte County. It also is reported that the grain crops this year are exceptionally good on the lighter lands on the west side of the Valley in the vicinity of Orland and Willows, which is out of the ordinary.

The wheats in the experimental plats at Davis are ripening slowly on account of the cold rainy season. Hard Federation wheat in the field plats has just reached the fully ripe stage, as have a few of the other early varieties, but most of the others are yet immature. All varieties of barley are badly lodged and nearly all fully ripe. It appears that the rains hastened their maturity. The varieties of oats in the plats are all nearly ripe.

One series of African barleys sown in triplicate 10-foot rows was harvested Friday and Saturday. Harvest of the replicated varieties in the nursery also has been started, and it is planned to begin on the replicated plats this week.

The precipitation since May 15 was as follows:

May 19	0.09 of an inch
May 30	0.23 " " "
May 31	0.03 " " "

The total for May was 1.43 inches, and in the season to date 19.23 inches, which is about two inches above normal.

J. Allen Clark, agronomist in charge of western wheat investigations, arrived from Washington this morning to study hybrid wheat material. He expects to remain about three weeks.

Agricultural Experiment Station, Berkeley (F. N. Briggs) (No report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 14

June 20, 1925
Personnel (June 11-20) and Field Station (June 1-15) Issue

PERSONNEL ITEMS

F. A. Coffman, associate agronomist in oat investigations, left Washington June 16 to harvest and thresh oats growing in cooperative nurseries and plats at Ames, Iowa, Lincoln and North Platte, Nebr., Manhattan and Hays, Kans., and Akron, Colo. He also will confer with officials of agricultural experiment stations in the States named.

Mr. Coffman wrote while en route to Lincoln, Nebr., that in western Maryland wheat and barley were ripening and harvest was just beginning. Oats appeared to be in fair condition, but corn was backward and many fields showed poor stands. All small grains were rather short in the straw.

In northern Illinois corn appeared rather backward and oats were heading short. In western Illinois and central Iowa the weather had been very dry also, but recent rains were very beneficial to crops. As a result of replanting many fields of corn are exceedingly irregular. Oats generally appeared to be heading unusually short. At Ames, Iowa, crop prospects are not so good as they were last year, because the dry spring has resulted in poor stands, especially of corn and oats. Early oats, such as Burt and Kherson, are heading exceedingly short, and it is probable that midseason and late varieties will produce the highest yields this year. Some smut infection was noted in the experimental plats at Ames. Progress in the experiments with corn at Ames has been retarded considerably by the dry weather.

A. C. Dillman, associate agronomist in charge of flax investigations, left Washington June 18 to confer with officials of agricultural experiment stations in Minnesota, North Dakota and South Dakota concerning cooperative flax experiments.

Dr. F. E. Kempton, associate pathologist in charge of barberry investigations, returned to Washington June 12 after an extended trip in the barberry-eradication area.

C. H. Kyle, agronomist in corn investigations, will leave Washington about June 27 to study the cooperative corn breeding plats at Knoxville, Tenn., Baton Rouge, La., and Florence, S. C., and to confer with officials of agricultural experiment stations in these States.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, returned to Washington June 12 from an extended trip in the interests of wheat investigations.

R. W. Leukel, associate pathologist, left Washington June 20 to take final notes on cooperative seed-treatment experiments at Madison, Wis., and to harvest wheat from the flag-smut experimental plats at St. Louis, Mo., and Granite City, Ill.

Dr. E. B. Mains, agent in the cooperative cereal-disease investigations at Purdue University Agricultural Experiment Station, arrived in Washington June 11 and spent nearly a week in conferences with specialists of the Office and in taking notes on the leaf-rust nursery at Arlington Experiment Farm.

M. N. Pope, associate agronomist in barley investigations, who left Washington June 11, writes that he expects to leave Fort Collins, Colo., on June 21 for Aberdeen, Idaho. He will be at the latter place about a month, engaged in the study and harvest of the cooperative barley nursery at the Aberdeen Substation. Mr. Pope writes that he saw many interesting barley fields in the vicinity of Hays and Colby, Kans.

F. D. Richey, agronomist in charge of corn investigations, will leave Washington June 23 to confer with officials of the Cornell University Agricultural Experiment Station at Ithaca, N. Y., regarding cooperative corn experiments.

C. W. Warburton, Director of Extension Work, U. S. Department of Agriculture, formerly agronomist in charge of cereal agronomy in this Office, was granted the honorary degree of Doctor of Science on June 15, by his alma mater, the Iowa State College.

VISITORS

Prof. John W. Gilmore, formerly in charge of the division of agronomy, at the California College of Agriculture, was an Office visitor June 12 and 17. He expected to sail on the 17th for Santo Domingo, to make a joint soil and agricultural survey for that Government. Professor Gilmore will be absent from the United States for several months.

Dr. L. D. Batchelor, professor of orchard management, of the Graduate School of Tropical Agriculture and Citrus Experiment Station, Riverside, Calif., was an Office visitor on June 15. Doctor Batchelor is in Washington conferring with various officials before leaving for an extended trip in France and Italy.

D. J. van den Berg, a graduate student from South Africa, was an Office visitor June 20, discussing organization of agricultural research and methods of cereal production. Mr. van den Berg is on his way back to enter the service of the Transvaal Department of Agriculture of Pretoria.

MANUSCRIPTS AND PUBLICATIONS

41 A manuscript, entitled "The Tillering of Grain as Related to Yield and Rainfall," by Ralph W. Smith, was approved June 20, for publication in the Journal of the American Society of Agronomy.

42 A manuscript, entitled "Why Burden the Forms of Domesticated Plants with a Latin Nomenclature?" by Carleton R. Ball, has been approved for publication in the American Journal of Botany. This paper was read before the Systematic Section of the Botanical Society of America at the Washington meeting, December, 1924.

Galley proof of Department Circular 356, entitled "The Common Barberry and How to Kill It," by F. E. Kempton and Noel F. Thompson, was read June 17.

ANNOUNCEMENT

The Corn Belt Section of the American Society of Agronomy will hold its summer meeting at the Michigan Agricultural College, East Lansing, Mich., July 9 and 10, 1925, to study the investigations in Farm Crops and Soils of the Michigan Agricultural Experiment Station. Professors C. R. Magee and C. E. Miller are the Committee on Program and Arrangements.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (No report)

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig) (No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (No report)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) [June 6]

Twenty-nine barberry locations in 19 counties in Iowa were inspected for infection of Puccinia graminis from April 23 to June 1. This survey included representative counties in all except extreme northwestern Iowa. Of the 792 bushes, sprouts, and seedlings inspected during this period, 78 seedlings, 198 sprouts, and 146 bushes showed pycnial or aecial infection. Positive infection on barberry was not confined to any particular section of the State and appeared in the northern and southern sections at about the same time. The first pycnial and aecial infection was found in central Iowa (Story county) on April 23.

The heaviest aecial infection appeared in southeastern Iowa (Henry county), where 15 barberry sprouts surrounded by quack grass showed an abundance of telial infection. Heavy pycnial infection was found in north central Iowa (Cerro Gordo county) on April 25. However, by June 1, this infection had largely dried up without forming aecia probably because of extremely dry weather.

No uredinial infection of stem rust on any of the susceptible cereals or grasses was found up to June 1.

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (June 4)

The original survey of Piatt County and the resurvey of Stephenson County have been completed.

On original survey the scouts have made it a practice to stop at every farmhouse and talk with someone. In this way tips on the location of barberry in out-of-the-way places may be gathered. An effort is made to make the interviews as short as possible in order that no time may be wasted.

A rusted barberry bush was found near Jerseyville in Jersey County on May 9. This is the farthest point south in Illinois that rust on barberry has been observed.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report).

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H, McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (June 18)

Several showers in the second week of June enabled us to seed most of the experimental sorghums. Wheat harvest is well under way and progressing rapidly in Woodward County.

On June 10 the broomcorn varietal plats were seeded; on June 11 the sorghum varietal experiment was seeded, and on June 13 the sorghum and broomcorn nurseries were sown. The fifth date-of-seeding plats were seeded on the 15th, while the milo rate-and-spacing experiments were sown on June 16. A large number of F_2 and F_3 generation hybrids were seeded on the 17th. Broomcorn and sorghum in the varietal plats emerged by the 16th, while those in the nurseries were showing on the 17th. Thinning to stands has been started on the three earlier dates.

Dr. H. V. Harlan visited the Station on Saturday, June 13, and was taken by auto to Lawton, Okla., on the 14th accompanied by E. F. Chilcott and the writer. A number of fields of winter barley were noted enroute to Lawton, and head samples were obtained from some.

The weather has been rather adverse for starting sorghums this spring. Maximum temperatures for the month to date, 103° on the 17th, 101° on the 16th, and 100° on the 15th; minimum for the same period, 55° on the 13th. Precipitation for the same period, 1.27 inches, which occurred in four showers between the 5th and 11th. At present it is hot and dry.

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (No report)

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (June 15)

The period of dry weather and high winds was broken June 11 when 1.28 inches of rain fell. For four consecutive days previous to this time, the average wind velocity was 14.8 miles per hour. Daily evaporation approximated 0.300 inch for the period.

All crops are much revived by the rain. Both winter and spring wheats were suffering from drought, but are now partially recovered. Oats and barley show little drought injury.

Corn is nearly a foot high and growing nicely. Sorghums have just been cultivated for the first time. Thinning of both corn and sorghums has been finished.

On June 16 will be held the Annual Field Day. A large crowd is expected if the weather continues fair.

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (June 15)

The weather for the first half of June has been uniformly cool with much cloudiness and frequent rains. The maximum temperature was 74 degrees, and the minimum, 36 degrees. Rain was recorded on 11 days, with a total of 3.28 inches, including the rain of 0.95 inch on the night of May 31.

All cereal crops, with the exception of corn and rye, are in good condition. Corn does not show much damage from cutworms but has made but little growth because of the cool, cloudy weather. Winter rye was injured by the drought in May and, being now fully headed, is too nearly mature to be greatly benefited by the abundance of rain. Winter wheat varieties sown in standing corn and in grain stubble are in excellent condition and are beginning to head.

The last seeding in the date-of-seeding and flax tillage experiment will be made tomorrow, weather permitting. This will end the seeding of spring cereal crops for the year. Several farmers have sown flax this month and a few are still seeding.

The winter and spring nurseries have been cultivated and hoed and the varietal plats have been trimmed and the roadways cultivated. Varietal stakes will be placed this week.

The Substation was visited June 13 by Messrs. John T. Sarvis and William Baird of the Northern Great Plains Field Station.

It is planned to hold the annual picnic at the Substation on July 18. The Stark County Fair will be held in Dickinson July 1 to 4.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) [June 16]

Flax sown in the flax-sick soil and uninfected soil nurseries May 26, 27 and 28, and June 2 and 3, emerged with good stands.

Seed of all available flax C. I. numbers was sown on uninfected soil June 6 and emerged with good stands about June 15.

Stands of flax in the varietal plats were so very poor, and weeds were so abundant, that it seemed advisable to reseed. The land was plowed and prepared for seeding June 13. The varieties were reseeded June 15, on the same date as the final seeding in the date-of-seeding-and-tillage experiment.

The first heads appeared some days ago in plats of Hard Federation and Quality wheats, though the plants are still very short. Early varieties of oats and barley also are beginning to head. Early varieties of all three cereals appear to have suffered somewhat from the drought preceding the June rains. Rows of Hard Federation and some other varieties in the wheat nursery are heading.

In the first half of June the drought was broken by rains totaling 5.71 inches. Some precipitation was recorded for all but 4 of the 15 days; the heaviest recorded for any 24-hour period was 3.04 inches on June 7; the next heaviest, 1.26 inches on June 15.

Maximum temperature for the same period, 82°, June 4; minimum, 40°, June 8.

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (June 15)

The first 14 days of June have been quite rainy. Precipitation was recorded on 9 of the 14 days. A total of 2.17 inches was recorded and it is raining again today (June 15).

All small grains under the cereal project have made vigorous growth in the last two weeks. Winter wheat is in the "boot" stage, while winter rye is in full head. Spring grains are five or six inches high and very vigorous. Weeds are numerous, especially in the winter wheat.

There is much complaint this spring among farmers of this community about winter wheat lacking vigor. Some think that wireworms or cutworms are the cause.

Temperatures have averaged low since the first of June. The minimum temperature recorded was 35° on June 2, 3, 4, 5 and 6; the maximum temperature was 72° on June 9.

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (No report)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell) (June 16)

Barley and oat varieties in the field plats, as well as varieties of wheat that had matured in the plat experiments, were harvested about ten days ago. Replicated varieties of barley in the nursery were harvested the first week in June, and the wheat varieties in the comparative experiments in the nursery are now being harvested. Although all grain was badly lodged, with the exception of the Federation varieties of wheat, the binder operated successfully and picked up the grain very well. In order that this might be accomplished, however, it was necessary to have men turn back into the plat the grain at the edges of the plat and to raise up the straw sufficiently so that the sickle bar could get the grain where too severely lodged.

For the past ten days J. Allen Clark, agronomist in charge of western wheat investigations, and the writer have been harvesting and making genetic studies of wheat-hybrid material. This will require about two days more, after which Mr. Clark plans to study varieties in the foreign-wheat nursery. W. T. Craig arrived here on June 4 to harvest Doctor Love's hybrid wheat material. Mr. Craig returned on June 12 via Seattle.

The commercial harvest of cereals in the Sacramento Valley has been in progress for about a week. Early reports are that yields will be considerably less than first believed. It was estimated that a certain summer-fallowed field of barley near Davis would yield 35 sacks, but it is yielding from 20 to 24 sacks. The quality of the barley is very poor for it is badly stained by the late rains. Mr. Clark and the writer went to Chico Saturday

and returned Sunday. While there they heard reports of Federation wheat being harvested with a yield of 12 to 15 sacks per acre. In most cases in this section the wheat is of very good quality. Barley also will be much brighter than at Davis on account of less rainfall. All up and down the Sacramento river the early-sown barley fields are badly lodged and are going down more each day, so that many are nearly on the ground. Through this mass of straw there is appearing a very vigorous growth of weeds on the richer alluvial lands, and in some cases it will be impossible to harvest. The reports are that the charges for threshing are going to be excessively high on some of the badly lodged fields. Despite the bad condition of a large number of fields there will be much good grain in the Valley this year, and a fair crop will be harvested.

Agricultural Experiment Station, Berkeley (F. M. Briggs) (No report)

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

LIBRARY

Vol. 17 No. 15

June 30, 1925
Personnel (June 21-30) and Project Issue

PERSONNEL ITEMS

Dr. J. C. Arthur, agent in the cooperative rust investigations at Purdue University Agricultural Experiment Station, will sail for Europe early in July, in company with Dr. F. D. Kern, of the Pennsylvania State College, to study rusts and to discuss questions of the terminology and classification of rusts with the leading mycologists and pathologists of Europe.

Miss Charlotte E. Blake, of Fargo, N. Dak., has been appointed junior clerk, effective July 1, to assist in the office of the State leader of barberry eradication, with headquarters at Fargo.

J. Allen Clark, agronomist in charge of western wheat investigations, wrote on June 20 that he had spent the day in conference with Dr. R. E. Clausen, associate professor of genetics at the University of California. The past three weeks Mr. Clark had spent at University Farm, Davis, Calif., studying and describing over 1,600 introductions of foreign wheat varieties and several hybrid combinations. Much of the time was spent with Mr. Florell in describing awn classes of F_3 plants of the following hybrids, namely, Hard Federation x Propo, Bobs x Propo, and Hard Federation x Bobs. This triangle hybrid combination was projected for the study of the inheritance of awnedness and its effect on the yield and crude-protein content of the grain. The crude-protein content of the grain from the F_2 plants had been determined. Selections were made in F_3 strains from high crude-protein F_2 plants. Over 30,000 F_3 plants were described for awn class. The data as obtained indicate that two or three genetic factor differences are involved in the crosses. No single 3:1 ratio was found in any of the crosses, but all were less complex than the results obtained from the Kota x Hard Federation cross recently published in the Journal of Agricultural Research.

Mr. Clark expected to proceed to Nephi, Utah, Cheyenne, Wyo., and North Platte, Nebr., to study the cooperative experiments with wheat. During July Mr. Clark will visit points in Minnesota, North Dakota, South Dakota, Montana and Idaho in the interests of western wheat investigations.

Oscar K. Dismang, of Xenia, Kans., has been appointed unskilled laborer, effective July 1, in connection with the cooperative cereal experiments at Manhattan, Kans.

Dr. H. V. Harlan, agronomist in charge of barley investigations, returned to Washington on June 30. He spent nearly two months at the Cooperative Testing Station, at Sacaton, Ariz., where this Office maintains its largest barley nursery. Doctor Harlan, assisted by Miss M. L. Martini, assistant in barley investigations, harvested, threshed, and weighed the yields from about 1,400 rod rows and a large nursery of head rows. These operations were accomplished entirely without any mechanical equipment. (Attention is called to the exceptional qualities of tamarisk for beating out barley.) The crop was very satisfactory. Some selections were chosen for increase plats. Many of the North African barleys, particularly those from Egypt, produced high yields.

On his way back to Washington, Doctor Harlan stopped in western Oklahoma to confer with State officials and growers concerning the notable increase in the winter-barley acreage in that State during the last five years. Tennessee Winter and Wisconsin Winter are the varieties most grown, and it would seem that winter barley has become a permanent addition to the crops of western Oklahoma.

George Janssen, of Wisconsin, was appointed agent, effective July 1, to fill the vacancy caused by the resignation last January of Miss Grace O. Wineland, assistant pathologist. Mr. Janssen will assist Dr. J. G. Dickson in the investigations of wheat scab and related diseases of corn that are being conducted in cooperation with the Wisconsin Agricultural Experiment Station at Madison.

Miss Marguerite Marquis, of Salesville, Mont., has been appointed clerk, effective July 1, in the office of the State leader of barberry eradication at Bozeman, Mont. Miss Marquis will fill the vacancy caused by the resignation of Miss Carlie Reddout on June 10.

M. A. McCall, agronomist in charge of cereal agronomy investigations, will leave Washington July 5 to spend about two months among the field stations of this Office, inspecting the cooperative and independent cereal experiments and conferring with State officials and the field personnel. His first stop will be at Ames, Ia., where he will inspect the cooperative investigations with corn and other cereals. He also will visit points in the following States: Nebraska, Idaho, Oregon, Washington, Montana, North Dakota, Minnesota, Wisconsin, Illinois, and Indiana. Mr. McCall expects to spend about two weeks at Lind, Wash., to complete manuscripts for publication relating to the cooperative experiments conducted at the Adams Branch Experiment Station. He will return to Washington, D. C., about September 1.

T. R. Stanton, agronomist in charge of oat investigations, will leave Washington July 5 to visit points in Iowa, Minnesota, North Dakota, Montana, Idaho, Wyoming, and Kansas in the interests of oat investigations. In addition to making observations on cooperative and other experiments with oats at various agricultural experiment stations Mr. Stanton will spend some time at Ames, Ia., assisting in the harvest of the cooperative oat nursery. He also expects to spend about two weeks at Aberdeen, Idaho, where he will join F. A. Coffman, associate agronomist in oat investigations, and assist in recording data on

and harvesting the extensive oat breeding nursery at the Aberdeen Substation. Mr. Stanton will return to Washington about September 1.

Dr. W. H. Tisdale, pathologist in charge of smut investigations, went to Wilmington, Delaware, on June 29 to inspect the cereal-disease control plats of the Dupont Chemical Company. On the whole the plats looked very well. Many of the results are comparable with those obtained at Arlington Experiment Farm with the same disinfectants.

John F. Trost, associate pathologist, who was granted a year's leave of absence in order to engage in graduate study at the University of Minnesota, has returned to his former duties in the department of botany of Purdue University. The appointment of Ralph R. St. John, who has been filling the vacancy during Mr. Trost's absence, was terminated June 30.

J. G. Willier, assistant agronomist in corn investigations, will leave Washington July 1 for Manhattan, Kans., where he will make his permanent headquarters and assist Dr. A. M. Brunson, associate agronomist, in the corn investigations that are being conducted cooperatively by the Kansas Agricultural Experiment Station and this Office. Mr. Willier also will continue at Manhattan some of the experiments with pop corn that he has conducted heretofore at the Arlington Experiment Farm.

VISITORS

J. W. Zahnley, director of the Kansas Seed Laboratory, Manhattan, Kans., was an office visitor June 27.

H. D. Hughes, professor of farm crops, Division of Crops and Soils of the Iowa State College, visited the Office June 29.

MANUSCRIPTS AND PUBLICATIONS

43 A manuscript, entitled "Webster, a Common Wheat Resistant to Black Stem Rust," by E. C. Stakman, M. N. Levine and F. Griffee, was approved June 22 for publication in Phytopathology.

Galley proof of Department Bulletin 1354, entitled "Productiveness of Successive Generations of Self-Fertilized Lines of Corn and of Crosses Between Them," by F. D. Richey and L. S. Mayer, was read June 22.

Galley proof of article, entitled "Variation in the Kherson Oat at Akron, Colorado," by F. A. Coffman and T. R. Stanton, for publication in the Journal of Agricultural Research, was read June 23.

Galley proof of Department Bulletin 1347, entitled "Foot-Rot Diseases of Wheat in America," by H. H. McKinney, was read June 24.

Cornell University Agricultural Experiment Station Bulletin 436, entitled "Results of Experiments with Oats in New York," by H. H. Love and W. T. Craig, has been received, dated January, 1925. (The investigations reported in this bulletin were conducted cooperatively by the Cornell University Agricultural Experiment Station and the Office of Cereal Investigations.)

The article, entitled "Problems and Progress in Barberry Eradication," by Carleton R. Ball, appears in the Proceedings of the Fourth Annual Meeting of the Conference for the Prevention of Grain Rust, University Farm, St. Paul, Minn., p. 18-25. January 12, 1925. This is the published account of Doctor Ball's talk before the Conference.

Illinois Agricultural Experiment Station Bulletin 255, Abridged, entitled "Corn Root, Stalk, and Ear Rot Diseases, and their Control Thru Seed Selection and Breeding," by James R. Holbert, W. H. Burlison, Benjamin Koehler, C. M. Woodworth, and George H. Dungan, has been received, dated May, 1925. This is an abridged edition of Bulletin 255 published in August, 1924, covering 239 pages.

The article, entitled "The Germination of Barley Under Late Spring Malting Conditions in India," by H. V. Harlan, appears in Science 61: 566-567. May 29, 1925.

The article, entitled "Corn Judging and the Productiveness of Corn," by Frederick D. Richey, appears in the Journal of the American Society of Agronomy, vol. 17, no. 6, p. 313-318. June, 1925.

The article, entitled "Biannual Cropping of Wheat Hybrids," by V. H. Florell appears in the Journal of the American Society of Agronomy vol. 17, no. 6, p. 354-356. June, 1925. (This paper reports experiments conducted cooperatively by the Office of Cereal Investigations and the California Agricultural Experiment Station.)

The article, entitled "The Harmful Barberry--Destroy It," by Lynn D. Hutton, appears in the Bulletin of the Green Section of the U. S. Golf Association, vol. 5, no. 6, p. 126-128, 3 fig. June 16, 1925.

Extension Circular 128 of the University of Nebraska Agricultural College Extension Service, entitled "Barberry Eradication in Nebraska," by A. F. Thiel, was received June 23. (The investigations reported in this Circular were conducted cooperatively with the Office of Cereal Investigations.)

Montana Agricultural Experiment Station Bulletin 177, entitled "Furrow Drill for Sowing Winter Wheat in Central Montana," by Ralph W. May and Clyde McKee, has just been received. (The data reported in this bulletin are based on investigations conducted cooperatively by the Office of Cereal Investigations and the Montana Agricultural Experiment Station.)

ANNOUNCEMENT

A Cereal Disease Conference will be held at

Iowa State College, Ames, Iowa, July 8 and 9;

University Farm, St. Paul, Minnesota, July 10 and 11;

North Dakota Agricultural College, Fargo, North Dakota, July 13 and 14.

Committee on Arrangements

Dr. I. E. Melhus, Ames, Iowa, Chairman
Dr. E. C. Stakman, St. Paul, Minnesota
Dr. H. L. Bolley, Fargo, North Dakota
Prof. A. T. Evans, Brookings, South Dakota

OBITUARY

Mark Alfred Carleton, formerly cerealist of the Office of Cereal Investigations, and recently in the service of a cotton growers' association in Peru, died in that country on April 24 of acute malaria, after a short illness, according to private advices received here the latter part of May. He leaves a widow and three children.

Mr. Carleton was born in Jerusalem, Ohio, March 7, 1866. His early education was obtained in the rural schools of Ohio and Kansas. He received the degree of Bachelor of Science at the Kansas Agricultural College in 1887. He became Professor of Natural History in Garfield University (now Friends University) at Wichita, Kans., during 1889-91. During 1891-92 he taught natural history in Wichita University, and during 1892-93 took a post-graduate course in botany and horticulture at the Kansas Agricultural College, receiving the degree of Master of Science. In 1893 he was Assistant Botanist at the Kansas Agricultural Experiment Station, his time being devoted chiefly to plant pathology and particularly to the rusts of cereals.

In March, 1894, Mr. Carleton was appointed Assistant Pathologist in the Division of Vegetable Physiology and Pathology, of the United States Department of Agriculture. During the seven years of service in pathological investigations he established the physiological relationships of nearly all the cereal rusts of this country and demonstrated the distinctness of the different forms of the same species of these rusts adapted to the same hosts, traced the yearly cycle of the orange leaf-rust of wheat, and showed that durum wheats, emmers, einkorns, and some other wheats are more or less resistant to rust.

In 1901 Mr. Carleton was made cerealist in charge of the Office of Grain Investigations in the newly-organized Bureau of Plant Industry. Some of the more permanent results of his cereal investigations have been the introduction of durum wheat into this country where it is now an established crop, with an estimated acreage of 4,340,000 acres in 1919; the establishing of the Swedish Select oat, the estimated area of which, in 1919, was 3,631,789 acres; the direction of investigations establishing the Sixty-Day oat, now one of the most popular "general purpose" varieties in this country; the introduction of hardier strains of the Turkey or Crimean group of wheats, including the Kharkof, to which an estimated area of 21,588,300 acres were devoted in 1919; the introduction of Black Winter emmer; introduction of the cultivation of winter barley into the Middle Western States, thus permitting a large increase in the acre yields of the barley crop; experiments showing the pronounced effect of the presence of water in the deterioration of the gluten content of wheat; and the inauguration and direction of experiments in the Texas Panhandle, which had much effect in establishing rational dry farming.

In 1898 and 1899 Mr. Carleton was sent by Secretary of Agriculture James Wilson as agricultural explorer to Russia and Siberia in search of rust-resisting and drought-resisting varieties of cereals. In 1900 he was in charge of the United States grain exhibit and member of the Jury of Awards at the Paris Exposition. He was chairman of Group 84 of the Jury of Awards at the Louisiana Purchase Exposition at St. Louis in 1904.

Mr. Carleton was granted 15 months leave of absence from the Department of Agriculture in 1912-13 to conduct the work of the Pennsylvania Chestnut Blight Commission.

After leaving the service of the United States Department of Agriculture in 1918 Mr. Carleton was in the employ of the United States Grain Corporation. In 1920 he went to Boca del Toro, Panama, to study diseases of bananas for the United Fruit Company. Later he was located at Cuyamel, Honduras, with the Cuyamel Fruit Co. He had been connected with the Laboratorio de Plagas Algodoneras at Piura, Peru, only since last autumn.

Mr. Carleton was a Fellow of the American Association for the Advancement of Science; member of the Botanical Society of America, the American Phytopathological Society, the American Genetic Association, the Kansas Academy of Science, the Botanical Society of Washington, the Biological Society of Washington and the Cosmos Club. He was decorated with the order of Merite Agricole by the French Government.

To him probably more than to any other person belongs the credit of founding the American Society of Agronomy. At the first meeting held in Chicago, December 31, 1907, to January 1, 1908, he was unanimously chosen its first president. During the formative years of its history Mr. Carleton had a very large share in determining its growth and development.

Mr. Carleton was the author of many publications. A list of these is appended.

Second List of Kansas Parasitic Fungi, Together with Their Host-Plants. Trans. Kans. Acad. Sci. 10 (1885-86): 88-99. 1887. (Junior author with W. A. Kellerman)

Characteristic Sand-Hill Flora. Trans. Kans. Acad. Sci. 12 (1889-90): 32-34. 1890.

Observations on the Native Plants of Oklahoma Territory and Adjacent Districts. U. S. Dept. Agr., Div. Bot., Contrib. Nat. Herbarium (1892) 1: 220-232. 1890-1895.

Preliminary Report on Rusts of Grain. Kans. Agr. Exp. Sta. Bul. 38, 14 p., 3 pl. 1893. (Junior author with A. S. Hitchcock)

Effect of Fungicides upon the Germination of Corn. Kans. Agr. Exp. Sta. Bul. 41: 63-79. 1893. (Junior author with A. S. Hitchcock)

Variations in Dominant Species of Plants. Trans. Kans. Acad. Sci. 13 (1891-92): 24-28. 1893.

List of Plants Collected by the Garfield University Expedition of 1889. Trans. Kans. Acad. Sci. 13 (1891-92): 50-57. 1893.

Studies in the Biology of the Uredineae--Notes on Germination. Bot. Gaz. 18: 447-457. 1893.

Notes on the Occurrence and Distribution of Uredineae. Science 22: 62-63. 1893.

Second Report on Rusts of Grain. Kans. Agr. Exp. Sta. Bul. 46, 9 p. 1. (Junior author with A. S. Hitchcock)

Uredineae Americanae exsiccatae. Bot. Gaz. 20: 32. 1895.

A New Aecidium of Peculiar Habit. Trans. Kans. Acad. Sci. 14 (1893-94): 44. 1896.

Variations in Dominant Species of Plants.--II. Trans. Kans. Acad. Sci. 14 (1893-94): 45. 1896.

Improvements in Wheat Culture. U. S. Dept. Agr. Yearbook 1896: 489-498, fig. 139. 1897. (Also in 13th Bienn. Rpt. (Pt. IV), Kans. State Bd. Agr. 18 (1901-1902): 499-504. 1903)

Cereal Rusts of the United States: A Physiological Investigation. U. S. Dept. Agr., Div. Veg. Phys. & Path. Bul. 16, 73 p., pls. 1-4, col., fig. 1. 1899.

The Basis for the Improvement of American Wheats. U. S. Dept. Agr. Div. Veg. Phys. & Path. Bul. 24, 87 p., pls. 1-10, figs. 1-5, 1 map. 1900.

Russian Cereals Adapted for Cultivation in the United States. U. S. Dept. Agr., Div. Bot. Bul. 23, 42 p., pls. 1-2, figs. 1-2. 1900.

Report on Vegetable Food Products, Class 39, Paris Exposition of 1900, in Rep. Com.-Gen. for U. S. to Paris Exposition, vol. V: 314-321. 1901.

Notes on the Life History of Certain Uredineae. Science 13: 249-250. 1901

A New Wheat Industry for the Semiarid West. U. S. Dept. Agr., Div. Veg. Phys. & Path. Circ. 18, 8 p., figs. 1-2. 1901.

Macaroni Wheats. U. S. Dept. Agr., B. P. I. Bul. 3, 62 p., pls. 1-11 (2 col.), figs. 1-2. 1901.

Emmer: A Grain for the Semiarid Regions. U. S. Dept. Agr., Farmers' Bul. 139, 15 p., figs. 1-3. 1901.

Successful Wheat Growing in Semiarid Districts. U. S. Dept. Agr., Yearbook 1900: 529-542, pls. 67-70 (2 col.). 1901.

Wheat Improvement in Kansas. In 13th Bienn. Rpt. (Pt. IV) Kans. State Bd. Agr. 18 (1901-1902): 505-516, 7 figs. 1903.

Culture Methods with Uredineae. Jour. Appl. Micros. and Lab. Methods 6: 2109-2114. 1903.

Investigations of Rusts. U. S. Dept. Agr., B. P. I. Bul. 63, 32 p., pls. 1-2, col. 1904.

The Commercial Status of Durum Wheat. U. S. Dept. Agr., B. P. I. Bul. 70, 70 p., pls. 1-5, fig. 1. 1904. (Senior author with Joseph S. Chamberlain)

Lessons from the Grain-Rust Epidemic of 1904. U. S. Dept. Agr., Farmers' Bul. 219, 24 p., figs. 1-6. 1905.

Improvement of the Oat Crop. In 14th Bienn. Rpt. (Pt. I) Kans. State Bd. Agr. 19 (1903-1904): 32-42, 15 figs. 1905.

Barley Culture in the Northern Great Plains. U. S. Dept. Agr., B. P. I. Circ. 5, 12 p. 1908.

Limitations in Field Experiments. Proc. 30th Ann. Meeting Soc. Prom. Agr. Sci. 1909: 55-61. [1909]

Ten Years' Experience with the Swedish Select Oat. U. S. Dept. Agr., B. P. I. Bul. 182, 47 p., pls. 1-4, figs. 1-4. 1910.

The Future Wheat Supply of the United States. U. S. Dept. Agr., Yearbook 1909: 259-272, figs. 4-5. 1910.

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Development and Proper Status of Agronomy. Proc. Amer. Soc. Agron. (1907-09) 1: 17-23. 1910.

Winter Emmer. U. S. Dept. Agr., Farmers' Bul. 466, 24 p., figs. 1-3. 1911.

Millets. In Bailey's Cycloped. Amer. Agr. vol. II--Crops, p. 469-474, figs. 693-702. MacMillan Co. 1911.

Fighting the Chestnut Tree Blight Disease in Pennsylvania. Amer. Fruit and Nut Jour. 6: 78-79. Sept.-Oct. 1912.

Report of the General Manager for the latter half of the year, 1912. In Rpt. Pa. Chestnut Tree Blight Com., 1912: 11-18. 1913.

The Preparation of Seed Grain for Spring Planting. In U. S. Dept. Agr. Farmers' Bul. 584: 6-7. 1914.

The Fight to Save the Chestnut Trees; Final Report of the General Manag... In Final Rpt. Pa. Chestnut Tree Blight Com. 1913: 27-60, 5 pls., 2 maps. 1914.

Adaptation of the Tamarisk for Dry Lands. Science n. s. 39: 692-694. 1914

Hard Wheats Winning Their Way. U. S. Dept. Agr., Yearbook 1914: 391-420, pls. 35-41, figs. 22-25. 1915.

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A Serious New Wheat Rust in this Country. Science n.s. 42: 58-59. 1915.

The Small Grains. IX, 699 p., 183 fig. MacMillan Co., N. Y. 1916.

Where Is the Sugar? In The Country Gentleman 85: 8, 56. Feb. 28, 1920.

Note on the Fusarium Wilt Disease of Bananas. Science 56: 663-664. 1922.

Some Remarks on the Literature of Rust Fungi. Science 60: 360-362. 1924.

PROJECT REPORTS

WESTERN WHEAT INVESTIGATIONS

(J. Allen Clark, Agronomist in Charge)

Uniform Winter Hardiness Nursery

In the fall of 1924, 28 varieties and strains of winter wheat were sown in triplicate rod rows at 24 agricultural experiment stations in the northern United States and in Canada. Observations on the winter survival of these varieties and strains are reported in the table which follows.

Little or no winterkilling occurred at the stations at Manhattan and Hays, Kans., Lincoln, Nebr., and Ottawa, Ontario. At four stations, Redfield, S. Dak., Mandan, N. Dak., Havre, Mont., and Saskatoon, Saskatchewan, complete winterkilling occurred, while at Brookings, S. Dak., and Fargo, N. Dak., there was considerable winterkilling. The hardiest strains this year were Buffum No. 17, Minhardi, Odessa, Kharkof Sel. 6938, Padui, and Minturki, in the order named. None of the new varieties included in the experiments exceeded these hardy strains.

Average survival in spring of 1925 of 28 varieties or strains of winter wheat grown in triplicated rod rows to determine winter hardiness at 24 experiment stations in the northern United States and in Canada in 1924 and 1925.

Variety	C.I. No.	State No.	Manhattan, Kans:	Hays: Kans:	Colby, Kans:	Cheyenne, Wyo.	North Platte Nebr.	Lincoln Nebr[b/]	Ames: Iowa	Ashland, Wisc.:	St. Paul, Minn.:	Brookings, S.Dak[b/]	Redfield: S.Dak:	Fargo: N.Dak.	Mandan N.Dak.
Hard Red Winter:															
Kharkof	1442		100	100	47	2	79	100	92	64	45	0	0	0	0
do (Sel.)	6938	2212 M. C.	100	100	82	12	91	100	93	90	83	2	0	0	0
Mont. No. 36	5549	Mont. 36	100	100	69	1	75	100	89	66	63	0	0	0	0
Karmont	6700		100	100	56	1	77	100	92	57	68	0	0	1	0
Turkey	3055		100	100	41	0	79	100	90	50	28	0	0	1	0
do (Sel.)	6152	Minn. 1488	100	100	84	53	92	100	90	67	88	0	0	0	0
do (Sel.1571C)	7364		100	100	73	0	87	100	92	51	32	0	0	3	0
Nebraska No. 6	6249	Nebr. 6	100	100	69	3	82	100	88	66	70	0	0	0	0
do No. 60	6250	Nebr. 60	100	100	83	34	94	100	96	73	68	0	0	0	0
Sherman	4430		100	100	84	0	60	100	93	47	22	0	0	0	0
Beloglina	1543		100	100	95	5	88	100	99	81	86	0	0	2	0
do	1667		100	100	95	5	85	100	92	73	73	0	0	3	0
Kanred	5146	Kans. 2401	100	100	80	4	82	100	93	71	68	0	0	2	0
"Tenmarq"	6936	Kans. 439	100	100	62	0	67	100	83	44	35	0	0	0	0
"Kanmarq"	6937	Kans. 440	100	100	86	0	71	100	89	55	43	2	0	0	0
Blackhull	6251		100	100	55	1	80	100	90	39	12	0	0	1	0
Malakof (Sel.)	6680	Wisc.11.825	100	100	94	15	89	100	95	41	63	4	0	T	0
Iobred	6934	Iowa 1949	100	100	52	2	87	100	90	74	45	1	0	0	0
Minard	6690	Minn. 2199	100	100	87	7	83	100	87	80	69	0	0	0	0
Padui	6153	Minn. 1491	100	100	91	52	88	100	90	64	94	11	0	T	0
Newturk	6935	166 B 1-6	100	100	57	0	80	100	92	65	8	0	0	0	0
Minturki	6155	Minn. 1507	100	100	93	27	89	100	90	74	99	12	0	0	0
Marquis x Kanred		Kans. 441	100	100	59	0	64	100	73	41	14	1	0	0	0
do		Kans. 449	100	100	73	0	71	100	90	59	42	0	0	0	0
P 1068 x Preston		Kans. 446	100	100	57	0	79	100	85	59	25	1	0	0	0
Soft Red Winter:															
Minhardi	5149	Minn. 1505	100	100	97	53	88	100	95	68	100	13	0	0	0
Buffum No. 17	3330		100	100	98	45	91	100	98	67	98	9	0	1	0
Odessa	6151	Minn. 1471	100	100	93	30	93	100	98	68	96	9	0	0	0

b/ Duplicate rod rows only

Continued

Variety	C.I. No.	State No.	Dickinson, N.Dak.	Moccasin, Mont.	Bozeman, Mont.	Havre, Mont.	Pullman, Wash.	Ithaca, N. Y.	Quebec, Que.	Ottawa, Ont.	Saskatoon, Sask.	Lethbridge Alta.	Edmonton Alta.	Average for 24 stations	Average for 15 stations a/
Hard Red Winter:															
Kharkof	1442		7	4	0	0	79	82	88	100	0	53	75	46.5	43.7
do (Sel.)	6938	2212 M. C.	15	90	27	0	70	88	88	100	0	93	94	59.1	64.0
Mont. No. 36	5549	Mont. 36	8	2	0	0	73	83	87	99	0	72	75	48.4	47.1
Karmont	6700		11	3	0	0	80	82	86	100	0	69	71	48.1	46.1
Turkey	3055		11	0	0	0	41	87	83	99	0	42	71	42.6	39.7
do (Sel.)	6152	Minn. 1488	23	82	3	0	56	87	89	100	0	95	79	57.8	63.0
do)Sel. 1571C)	7364		2	0	0	0	42	85	83	100	0	63	58	44.6	42.9
Nebraska No. 6	6249	Nebr. 6	20	4	0	0	69	82	83	98	0	82	79	49.8	49.6
do No. 60	6250	Nebr. 60	13	88	1	0	69	85	84	100	0	91	82	56.7	60.5
Sherman	4430		1	0	0	0	62	73	67	100	0	40	72	42.5	39.1
Beloglina	1543		15	58	3	0	77	83	88	100	0	91	90	56.7	60.1
do	1667		13	34	1	0	47	80	59	100	0	86	81	51.1	53.3
Kanred	5146	Kans. 2401	7	8	0	0	90	83	69	100	0	50	88	49.8	48.1
"Tenmarq"	6936	Kans. 439	1	1	0	0	68	77	67	100	0	43	73	42.5	38.4
"Kanmarq"	6937	Kans. 440	2	3	0	0	52	82	81	100	0	62	81	46.2	45.0
Blackhull	6251		1	0	0	0	65	87	69	99	0	30	72	41.7	36.6
Malakof (Sel.)	6680	Wisc. 11.825	8	55	8	0	57	88	91	100	0	91	90	53.7	56.3
Iobred	6934	Iowa 1949	3	10	6	0	65	85	92	100	0	82	85	49.1	48.6
Minard	6690	Minn. 2199	12	70	12	0	54	82	89	100	0	81	92	54.4	57.9
Padui	6153	Minn. 1491	7	82	13	0	55	88	84	100	0	92	94	58.5	64.1
Newturk	6935	166 B 1-6	11	1	0	0	64	82	87	100	0	39	85	44.6	41.7
Minturki	6155	Minn. 1507	17	84	14	0	51	75	86	100	0	89	91	58.0	64.3
Marquis x Kanred		Kans. 441	1	1	0	0	69	75	79	98	0	47	63	41.0	36.1
do		Kans. 449	5	1	0	0	63	78	83	99	0	42	75	45.0	42.7
P 1068 x Preston		Kans. 446	5	1	0	0	57	75	79	97	0	38	79	43.2	40.3
Soft Red Winter:															
Minhardi	5149	Minn. 1505	17	98	38	0	60	87	88	100	0	99	92	62.2	69.7
Buffum No. 17	3330		27	100	61	0	43	88	97	100	0	100	96	63.3	72.5
Odessa	6151	Minn. 1471	15	88	24	0	70	87	94	100	0	99	94	60.8	66.7

a/ Average for stations not including Manhattan and Hays, Kans., Lincoln, Nebr., where no killing occurred, Mandan, N.D
edfield, S.D., & Saskatoon, Sask., where complete killing occurred,& Ithaca, N.Y.,& Pullman, Wash., where killing
ffects differed from those at other stations.

RUST INVESTIGATIONS

(Dr. H. B. Humphrey, Pathologist in Charge)

Report of Rhamnus Infection from April 23 to June 1, 1925

by

S. M. Dietz, Assistant Pathologist in Charge of Crown Rust Investigations

Two species of Rhamnus occur in Iowa out of 14 in the United States known to be susceptible to crown rust of oats. Rhamnus cathartica, a cultivated species escaping in some cases, is generally distributed throughout the State. Rhamnus lanceolata is a native species growing in the southern half of Iowa. The rôle of these two species in the dissemination of crown rust has been further studied this spring.

Thirty-two locations of Rhamnus cathartica, comprising over 9,000 bushes, were inspected in 13 Iowa counties located in the eastern half of the State and two counties of southern Minnesota during the period between April 23 and June 1, 1925. Bushes in 22 of these locations were infected. The time of inspection in some locations was undoubtedly too early, indicated by the large percentage of bushes with only pycnial infection. Bushes in the northern and southern parts of Iowa were infected at about the same time. The first infection of Rhamnus cathartica was found in central Iowa (Story County) on April 23; the maximum degree of infection was about 20 per cent.

Bushes in just three out of a total of 27 locations of Rhamnus lanceolata were not infected. Over 5,000 bushes were inspected throughout the southern half of Iowa and north-central Missouri. The first infection was found on April 27 on R. lanceolata in central Iowa (Warren County).

The pycnial and aecial infection on R. lanceolata in southwestern Iowa was nearly 100 per cent; indeed, it was almost impossible to find a leaf without several aecia. Many of these bushes were so heavily infected that they had a yellowish appearance from a distance. This indicated the possibility of a severe epidemic for scuthwestern Iowa and northern Missouri. However, this area was revisited on May 26 and most of the aecial material had dried up. Although an inspection of over 300 oat fields and many wild grasses was made, no urediniospores were found on oats or other grasses prior to June 6, when M. A. Smith, State leader of barberry eradication in Iowa, located one uredinial sorus on oats in Warren County.

The failure of the aeciospores to infect oats and grasses probably was due to the extremely dry weather. A general heavy rain fell over the upper Mississippi Valley on June 1.

Infection of Rhamnus lanceolata in Iowa and Missouri

Locations visited			Infection on Rhamnus lanceolata	
County	Number bushes	Date 1925	Pycnial	Aecial
Cass, Ia.	10	May 2	+	+
Cass, Ia.	100	May 2	+	+
Clarke, Ia.	10	April 29	+	+
Clarke, Ia.	5	April 29	+	+
Clarke, Ia.	500	May 24	+	+
Davis, Ia.	10	May 6	+	+
Decatur, Ia.	500	April 29	+	+
Decatur, Ia.	1000	April 30	+	+
Decatur, Ia.	500	May 26	+	+
Henry, Ia.	10	May 7	-	-
Henry, Ia.	10	May 7	+ (few)	+ (few)
Johnson, Ia.	10	May 9	+	-
Louisa, Ia.	10	May 7	-	-
Louisa, Ia.	1	May 7	-	-
Lucas, Ia.	500	May 24	+	+
Mercer, Mo.	1000	April 30	+	+
Mercer, Mo.	1000	May 26	+	+
Montgomery, Ia.	1	May 1	+	+
Page, Ia.	100	May 1	+	+
Ringgold, Ia.	25	April 30	+	+
Ringgold, Ia.	1	April 30	+	+
Taylor, Ia.	1	April 30	+	+
Wapello, Ia.	1	May 6	+	+
Warren, Ia.	100	April 27	+	+
Warren, Ia.	30	April 28	+	+
Warren, Ia.	100	May 24	+	+
Warren, Ia.	30	May 24	+	+

Crown-Rust infection on Rhamnus cathartica in Iowa, Minnesota and Wisconsin

Locations visited			Infection on Rhamnus cathartica	
County	Number bushes	Date 1925	Pycnial	Aecial
Buchanan, Ia.	3	May 15	-	-
Buchanan, Ia.	50	May 15	-	-
Blackhawk, Ia.	1000	May 15	-	-
Hamilton, Ia.	60	April 26	+	-
Hardin, Ia.	150	April 26	+	-
Hardin, Ia.	200	April 25	+	-
Hardin, Ia.	500	April 25	+	-
Hardin, Ia.	500	May 16	+	+
Hardin, Ia.	500	May 16	+	-
Jefferson, Ia.	100	May 6	-	-
Jackson, Ia.	200	May 8	-	-
Jackson, Ia.	500	May 8	+	-
Jackson, Ia.	30	May 8	-	-
Lucas, Ia.	80	April 28	+	+
Marshall, Ia.	40	May 13	+	-
Marshall, Ia.	100	May 13	-	-
Marshall, Ia.	135	May 13	+	+
Mower, Minn.	150	May 30	+	-
Story, Ia.	50	April 23	+	-
Story, Ia.	15	April 27	+	-
Story, Ia.	15	June 4	+	+
Tama, Ia.	336	May 14	+	+
Tama, Ia.	400	May 14	+	-
Tama, Ia.	96	May 14	+	+
Tama, Ia.	153	May 14	-	-
Tama, Ia.	158	May 14	+	+
Tama, Ia.	94	May 14	+	-
Steele, Minn.	2500	June 30	+	-
Worth, Ia.	800	April 26	-	-
Worth, Ia.	200	April 25	-	-
Wright, Ia.	200	April 25	+	-
Waukesha, Wis.	250	May 30	+	+

JUL 22 1925
BUREAU OF
PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 16

July 10, 1925
Personnel (July 1-10) and Field Station (June 16-30) Issue

PERSONNEL ITEMS

Dr. Carleton R. Ball, senior agronomist in charge, has submitted for publication in the Phi Kappa Phi Journal, the address he made before the faculty and students of the Florida State College for Women at Tallahassee on May 22. The article is entitled "Some Obligations in Education."

Dr. Carleton R. Ball, will leave Washington on or soon after July 15 to visit field stations in the north and west. On August 4 he will address the annual meeting of the National Home Economics Association at Berkeley, Calif., on the subject of Cooperation.

He expects to join Dr. H. L. Shantz, of the Bureau of Plant Industry, Dr. O. E. Baker, of the Bureau of Agricultural Economics, and Dr. C. F. Marbut, of the Bureau of Soils, in a crop, vegetation, and soil survey of the Prairie Provinces of Canada. The party will come together at Poplar, Mont., on the night of August 11. The survey will start on the morning of the 12th, the party proceeding in two Ford trucks equipped for a study of soils and vegetation and the collection of plants. Doctor Ball will be in the field about two months.

Donald G. Fletcher, assistant pathologist, who has been in charge of cooperation in barberry eradication between this Office and the Conference for the Prevention of Grain Rust since June, 1922, has resigned his position to become secretary-treasurer of the Conference, with headquarters at Minneapolis.

Dr. H. B. Humphrey, senior pathologist in charge of rust investigations, left Washington July 6 to attend field meetings and a cereal disease conference at Ames, Ia., Albert Lea, Minneapolis, and St. Paul, Minn., and Fargo, N. Dak., from July 8 to 14, inclusive. He also will confer with officials of agricultural experiment stations and with coworkers in rust investigations and inspect nursery experiments in Indiana, Illinois, Wisconsin, South Dakota, and Kansas. He will return to Washington about July 23.

On July 25 Doctor Humphrey will go to New York, Maine, Vermont, Massachusetts and to Ontario, Quebec, New Brunswick, Nova Scotia, and Prince Edward Island. He will inspect uniform cereal rust nurseries, collect data on varietal susceptibility of oats to oat blast, make observations on the distribution of barberry and buckthorn and the relation of same to stem rust and crown rust, and confer with officials of agricultural experiment stations, including plant pathologists. Doctor Humphrey will return to Washington about August 4.

Dr. F. E. Kempton, associate pathologist in charge of barberry eradication, left Washington July 6 to attend field meetings and a cereal disease conference at Ames, Ia., Albert Lea, Minneapolis, and St. Paul, Minn., and Fargo, N. Dak., from July 8 to 14, inclusive. He also will go to Colorado, Illinois, Indiana, Kansas, Kentucky, Michigan, Missouri, Montana, Nebraska, Ohio, South Dakota, Wisconsin, and Wyoming, to take notes on the prevalence of stem rust and its relation to barberry locations, and will confer with Federal, State, and county officials in the States named regarding the progress of barberry eradication and supervise the actual eradication in certain localities. Doctor Kempton will be in the field about three months.

C. H. Kyle, agronomist in corn investigations, returned July 10 from an inspection of the cooperative corn experiments in Louisiana, Tennessee, and South Carolina. As a whole the growth of corn on the experimental plats is excellent, but a poor stand was obtained in South Carolina and in part of the experiments in Tennessee. The hand-pollinating season is closed at Baton Rouge.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, will leave Washington on July 12 for Ithaca, N. Y., where he will confer with cooperators and experiment station officials and take notes on cooperative cereal experiments. Doctor Leighty will return to Washington about July 25.

M. A. McCall, agronomist in charge of cereal agronomy investigations, wrote on July 9 that he found corn in good condition and well advanced at North Platte, Nebr. Wheat and oats also were looking well. Mr. McCall had spent some time at Ames, Ia., conferring with Messrs. Bryan, Burnett, Dietz and Jenkins. He also visited officials of the Nebraska Agricultural Experiment Station at Lincoln. Mr. McCall expected to leave North Platte on July 10 for Aberdeen, Idaho.

F. D. Richey, agronomist in charge of corn investigations, attended a meeting of the Committee on Corn Improvement of the Corn Belt States of the Association of Land Grant Colleges on July 8 to formulate a cooperative program of corn improvement by the agricultural experiment stations and the United States Department of Agriculture under the Purnell Act. Mr. Richey also attended the meetings of the Corn Belt Section of the American Society of Agronomy at East Lansing, Mich., on July 9 and 10.

Dr. W. H. Tisdale, pathologist in charge of smut investigations, was authorized to attend field meetings and a cereal disease conference at Ames, Ia., Albert Lea, Minneapolis, and St. Paul, Minn., and Fargo, N. Dak. He also will confer with officials of agricultural experiment stations and others regarding cereal smut investigations in Wisconsin and Illinois.

Dr. William H. Weston, who is spending the summer in Cuba under the auspices of the Tropical Plant Laboratory, wrote on June 19 from Havana that he had discovered the Physoderma or brown-spot disease of corn in one of the century-old maize plantings in the province of Santa Clara. More recently he writes that he has discovered the same disease in the Province of Mantanzas.

John G. Willier, assistant agronomist in corn investigations, arrived July 3 at Manhattan, Kans., where he will be permanently located as assistant to Doctor A. M. Brunson, in the experiments with corn conducted cooperatively with the Kansas Agricultural Experiment Station.

MANUSCRIPTS AND PUBLICATIONS

44 A manuscript, entitled "Physiological and Biochemical Studies on Cereals.--V. Nitrogen Metabolism in Etiolated Corn Seedlings," by S. L. Jodidi, was submitted June 11 for publication in the Journal of Agricultural Research. (The investigations reported in this manuscript were conducted cooperatively by the Office of Cereal Investigations and the Office of Plant Physiological and Fermentation Investigations, Bureau of Plant Industry.)

45 A manuscript, entitled "Relative Susceptibility of Spring Wheat Varieties to Stem Rust," by J. Allen Clark, John H. Martin and E. C. Stakman, was submitted July 1 for publication as a Department Circular.

46 A manuscript, entitled "Rice Experiments at the Biggs Rice Field ... tion," by Jenkin W. Jones, was submitted July 1 for publication as a bulleti of the Departmental series.

47 A manuscript, entitled "A Mosaic Disease of Winter Wheat and Winter Rye Caused by a Soil-Borne Virus," by H. H. McKinney, was submitted July 3 for publication in the bulletin series of this Department.

48 An abstract, entitled "Oat Improvement in the Western Half of the United States," by T. R. Stanton and F. A. Coffman, was approved July 7 for publication in the Journal of the American Society of Agronomy.

49 A manuscript, entitled "The Barberry Eradication Campaign in Montana: Its Object, Nature and Progress," by H. E. Morris and W. J. Popham, was submitted July 9 for publication as a cooperative bulletin of the Montana Agricultural Experiment Station.

50 A manuscript, entitled "Berberine in the Common Barberry (Berberis vulgaris L.)," by E. R. Schulz, was approved July 9 for publication in the Journal of the American Chemical Society.

51 A manuscript, entitled "Branching of Rice Plants," by Jenkin W. Jones, was approved July 9 for publication in the Journal of the American Society of Agronomy.

Galley proof of Farmers' Bulletin 1464, entitled "Barley: Culture, Uses and Varieties," by Harry V. Harlan, was read July 3.

Page proof of Department Circular 356, entitled "The Common Barberry and How to Kill It," by F. E. Kempton and Noel F. Thompson, was read July 3.

Page proof of article, entitled "Variation in the Kherson Oat at Akron, Colorado," by F. A. Coffman and T. R. Stanton, for publication in the Journal of Agricultural Research, was read July 8.

Bulletin 266 of the Illinois Agricultural Experiment Station, entitled "Factors Influencing the Lodging of Corn," by Benjamin Koehler, G. H. Dungan and J. R. Holbert, was received July 6. (The investigations reported in this Bulletin were conducted cooperatively by the Office of Cereal Investigations and the Illinois Agricultural Experiment Station.)

NOTICE

At his own request, under date of June 19, Doctor Humphrey has been relieved from the duties of Senior Pathologist in Charge of Cereal Disease Investigations, and designated as Senior Pathologist in Charge of Rust Investigations. He will give his full time to the administration of our large and very important rust project, and to research in connection with it.

Effective July 1, Dr. A. G. Johnson is designated as Senior Pathologist in Charge of Cereal Disease Investigations until further notice. The pathologic council, appointed some months ago to act on all matters concerning policies and important procedure in our cereal disease projects, will continue to function as heretofore, Doctor Johnson acting as chairman, except as he shall otherwise designate.

Carleton R. Ball,
Senior Agronomist in Charge.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (July 9)

The weather was excellent for harvesting, which was completed in June. Threshing operations have been in progress for two weeks. With continued favorable weather threshing will be finished in a week.

The yields of the small grains will be influenced only slightly, if at all, by lodging or weather injury in the shock, which is exceptional for this locality. Oat yields will be decreased somewhat because of damage by sparrows. On the whole, the yields of all small grains will be average or above.

Yields of the winter barley varieties grown in duplicate fortieth-acre plats are given below. The yields are arranged in comparison with the yield of Wisconsin Winter, the check variety grown in every fifth plat; the check yield represents the average of the four plats of Wisconsin Winter nearest to the variety compared.

Yield of Varieties and Selections of Winter Barley in Duplicate 40th-Acre Plats
Arlington Experiment Farm, 1925

Variety	C.I.No.	Actual Yield (Bu. per Acre)	Ave. Yield of 4 check plats (Bu. per acre)	Gain or loss from check (bu.)
Orel	351	48.1	38.8	9.3
Han River	2163	42.2	38.8	3.4
Selection 47	3542	41.1	38.6	2.5
Alaska	4106	40.1	38.6	1.5
Selection 61	3545	39.8	38.6	1.2
Pidor	901	39.9	38.8	1.1
Wisconsin Winter	2167	39.7	38.8	.9
Selection 66	---	39.4	40.0	- .6
Selection 52	3543	32.5	34.2	-1.7
Selection 12	3534	30.4	34.2	-3.8
Tenn. Beardless 6	2746	34.0	38.4	-4.4
Tenkan	646	34.2	39.3	-5.1
Tenn. Beardless 5	3384	32.6	38.4	-5.8
Selection 57	3444	29.2	38.6	-9.4
Scottish Pearl	277	28.9	39.3	-10.4
Tenn. Winter	257	27.6	39.3	-11.7
Nakano Wase	754	23.5	35.8	-12.3
Selection 45	3540	21.9	34.2	-12.3
Selection 27	3538	27.7	40.0	-12.3
Selection 28	3539	21.3	35.8	-14.5
Selection 24 (short hair)	3536	25.1	40.0	-14.9

Continued Variety	C.I.No.	Actual Yield (Bu. per Acre)	Ave. Yield of 4 check plats (Bu. per acre)	Gain or loss from check (bu.)
Selection 25 (short hair)	3537	24.1	40.0	-15.9
Nakano Wase	2166	19.0	35.8	-16.8
Selection 23 (long hair)	3535	13.7	34.2	-20.5
Selection 46	3541	12.5	35.8	-23.3
Wisconsin Winter	2159	38.0 1/		

1/ Average of 16 check plats.

The selection of Orel, made in 1917 by Dr. H. V. Harlan, continues to appear of merit. Several other promising selections, made primarily for winter hardiness, have yielded high in the four-year experiment in spite of the fact that the winter temperatures have not been destructive to the barley crop.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig) (July 2)

The writer returned from Davis, Calif., on June 27, having taken notes on and harvested the hybrid wheat material grown at the University Farm. Some very interesting material, including the species crosses Emmer x Polonicum, Aegilops x Wheat, and others, was harvested and sent back to Ithaca for classification studies. The crosses of Sonora, a beardless wheat, with Honor and Forward, also both beardless, segregated an entirely bearded wheat at the ratio of 15 beardless to 1 bearded. Very interesting results also were obtained from the material sown at Davis for the study of dwarfness.

On the return trip to Ithaca stops were made at Pullman, Wash., Bozeman, Mont., Mandan and Fargo, N. Dak., St. Paul, Minn., and Urbana, Ill. The opportunity to see the cereal experiments and to consult with the men in charge at these stations will be profitable to us in the investigations at Ithaca.

The wheat harvest will begin at Ithaca about July 14. The experiment is one of the best in many years,--not a heavy crop, but a medium and uniform experiment. The Forward wheat used as a check shows up well. Although there was quite an infection of loose smut in the varietal experiment this year, not a single smutted head has been found in the Forward. From its present appearance it will not be outyielded by very many of the varieties and strains in the experiment.

Some of the oats are heading a little short as the result of dry weather in June, but since the recent rains we feel assured of a normal crop and the prospect for a uniform experiment is very promising.

Dr. H. H. Love reports favorable progress of his work at Nanking, China. He had been giving three lectures a week at the University of Nanking but expected soon to start the selection of barley and wheat for head-row experiments. He will have several thousand head rows this fall, besides the large quantity of material taken from this country. The work on wheat, rice, corn, and soybeans in the crops is being pushed farther north this year.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett) (June 26)

Because of the dry weather the oats began to ripen earlier than usual. However, this premature ripening has been checked by rains in the last ten days. At least 90 per cent of the strains of oats in nursery rows are fully headed, and about 50 per cent are in the first-ripe stage. A relatively small percentage is about 50 per cent ripe.

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (July 3)

In June original survey was begun in Macon, Christian, Montgomery, Shelby, Moultrie, Douglas, Edgar, Coles, Cumberland, Clark, and Vermillion counties. Most of the field men began operations on June 16. All are enthusiastic. Many barberries are being found.

Form letters mailed to rural-box holders just before the survey started have brought several leads on barberry locations.

Several tons of crushed rock salt were applied to barberries growing in the escaped area at Gurnee, It is planned to clean up the area this year.

Field men have shown unusual interest in writing news stories for the county papers. Many good stories have been published.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer) (July 3)

Twelve field agents left on July 1 to begin the second farm-to-farm survey of Clinton, Howard, and Tipton counties. The resurvey of 23 southern counties and the publicity work in Frankfort, Kokomo, Tipton, and near-by towns were begun on the same date. The work done by the scouts will be carefully checked to insure 100 per cent efficiency on the second survey. The scouts have been instructed to drive over every road in the county and stop at every farmhouse; both men are to get out of the car to inspect the yard, garden, orchard, and near-by groves. They also have been instructed to carefully survey on foot all territory within two miles of every fruiting and every sprouting barberry bush. The reason for including sprouting bushes is that we do not know whether the original bush has borne fruit. Our motto is "Take no chances. Get every bush."

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (June 30)

During the last three days in May several fields of wheat, oats, and rye in southwestern Ohio were inspected for the first appearance in the State of uredinia of the black stem rust. Some of the fields were in the immediate vicinity of infected barberries. No uredinia of stem rust were found at that time. From June 8 to 10, inclusive, the same fields of grain were again inspected and a small quantity of uredinial infection was found on wheat adjacent to infected barberries near Lewisburg. This was the first uredinial infection of stem rust on grain found in the State this year.

On June 20 uredinia of P. graminis secalis were found on rye near New Carlisle. The infection was heavy on volunteer rye near infected barberries and less heavy at some distance from the barberries. On June 21 an abundance of uredinia of stem rust was found on wheat near Lewisburg in the field where uredinia were found in small quantity on June 10. Some of the stem rust had reached the telial stage on June 21, but the epidemic in that neighborhood was confined to within one mile of the infected barberries. The wheat was in the soft dough and hard dough stages. On June 22 local epidemics of stem rust on wheat were found in fields near infected barberries not far from West Carrollton and near Dayton, in Montgomery County. Wheat and susceptible grasses near infected barberries at Sidney were inspected on June 22 but no uredinia of stem rust were found. No uredinia of stem rust were found on grains or wild grasses at Maumee on June 23. A specimen of the telial stage of stem rust on new wheat was received from near Middletown in Butler County. The collection was made on June 25. Uredinia of stem rust have been found during the latter part of June in Portage County on Poa compressa, Triticum vulgare, Phleum pratense, and Agrostis.

So far as known comparatively few stem-rust epidemics have developed in Ohio this spring and those which have occurred are near infected barberries and are very limited in extent. The weather has not been very favorable for the development of stem rust, although leaf rust is present on wheat throughout Ohio. In many places leaf rust is very heavy. Wheat cutting was in full swing in central Ohio on the last of June.

Vaselined slides were exposed at a height of ten feet from the ground at Columbus on each day between June 2 to 24, four slides being exposed each day. The exposures were made to determine the spore content of the air near the surface of the ground on various dates. At about the same time spore traps were exposed during aeroplane flights at McCook field near Dayton. These exposures were made at different altitudes to determine the spore content of the upper atmosphere at various times.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (June 27)

Field activities in barberry eradication are now in full swing. A second survey has been started in Racine, Jefferson, Rock, Dane, Green, Iowa, Lafayette, Pierce, and Calumet counties. That of Waukesha County will soon be completed. Several new plantings have been located.

The first stem rust spread from barberries was found on quack grass near Madison on June 8. This is the same location where the first stem rust on grains and grasses was found in 1924 (June 13), indicating that the stem-rust spread from barberries occurred about a week earlier this year than last. An intensive survey for stem rust on grains and grasses has been made, but none has been found except near barberries.

The weather in Wisconsin has been somewhat out of the ordinary. The last few days of March and early April were quite warm but dry. A few rains occurred after April 15; aecia appeared on barberries about April 27. The weather for most of the month of May was quite cool.

Leaf rusts have developed lightly in June. Buckthorn bushes in general have been infected very heavily. The same is true of barberries.

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (July 1)

About the time crops are ready to dry up entirely a slight rainfall helps to revive them. In spite of the dry hot weather sorghums are making a fair showing. The precipitation this season has been very local, and but one rain this year has totaled more than an inch.

From reports it appears that wheat is turning out somewhat better than estimated.

M. N. Levine, of University Farm, St. Paul, Minn., inspected the uniform rust nursery for rust on the 18th of June; stem rust was found on some of the wheats.

All sorghums, with the exception of the July 15 seeding in a small date-of-seeding experiment, are seeded and have emerged. At present thinning is progressing nicely; this will be followed by cultivation, which will leave the crop in good condition.

Maximum temperature for last half of June, 104 degrees on the 22nd; minimum, 60 degrees on the 25th; precipitation, 0.63 inch on the 23d; 0.17 inch on the 26th. The total rainfall recorded for the first six months of 1925 is 7.25 inches.

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (July 1)

Harvest of wheat and oats in the nursery and at the agronomy farm was completed the week of June 21, somewhat earlier than usual. Wheat harvest is now in full swing in northwestern counties where the crop is excellent. Corn is reported to be in good to excellent condition over most of the State. Grain sorghums are making fine growth and are a foot high as far west as Dodge City. On June 30 temperatures of 100 degrees or higher were reported from a good many counties; a maximum of 110 degrees was reached at Hutchinson.

On June 2, Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, accompanied by C. O Johnston, made studies of Aegilops in wheat fields of Kiowa County. He spent June 3 and 4 at Manhattan on wheat experiments and June 5 at one of the new outlying experimental fields near Columbus, in Cherokee County, southeastern Kansas. It is planned to move most of the nursery experiments with soft red winter wheat from Manhattan to Columbus. Doctor Leighty and Mr. Johnston will cooperate with the writer in these experiments, which will include studies of leaf-rust resistance, resistance to Hessian fly, and lodging. Mr. I. K. Landon, whose headquarters are at Parsons, Kans., is in direct charge of experiments on all five of the southeastern Kansas experiment fields.

John H. Martin, of the Office of Cereal Investigations, was a Station visitor on June 12 and 13.

The first agronomy farm field day was held on Saturday, June 13, with an attendance of about 500. It would have been much larger had not a heavy rain on the previous day put the roads in bad condition.

The writer, together with Messrs. Martin and Pope, spent June 15 and 16 at the Hays Branch Station, and June 17 at the Colby Substation, inspecting wheat and barley experiments. Oats, barley, and wheat at Hays were very short crops because of lack of moisture. Very little good wheat was seen between Hays and Oakley, but in Thomas County crop conditions were much better. It was surprising to find several fields of Michigan Black Barbless barley near Quinter, Kans. This variety, which was introduced from Michigan three or four years ago, seems to be doing fairly well in comparison with the commonly grown South African barleys.

M. N. Levine, of University Farm, St. Paul, Minn., spent the week of June 21 inspecting and taking notes on uniform rust nurseries at Colby, Manhattan, Hays, and Columbus.

F. D. Ruppert, graduate assistant in crop improvement, left on June 20 to take up his new position with Case, Pomeroy & Company of New York City. Before reporting for duty in New York Mr. Ruppert will make an extensive trip through the spring-wheat belt with R. O. Cromwell, crops statistician for Lamson Bros. Company, of Chicago.

D. D. Hill, a 1925 graduate of the Oregon Agricultural College, has been appointed fellow in crop improvement to succeed Mr. Ruppert. Mr. Hill reported for duty on June 1 and is now taking plant and kernel notes on about 2,600 F_2 plants of the Nebraska 28 x Kanred material for studies of inheritance of earliness and in the production of an early variety.

S. F. Kollar has been appointed assistant in crop improvement; he is the first permanent assistant ever assigned to this investigation.

Nursery threshing was begun on the morning of July 1. A new Toledo direct reading balance for weighing nursery samples has been installed. This costs about $190, has a capacity of 600 grams with an accurate reading down to two grams on one pan, and on the larger platform has a capacity of 16 kilograms with accurate readings down to 20 grams. This scale has the advantage of being both accurate and quick to read.

The last State legislature appropriated funds for soil survey in two counties. Field men of the Federal Bureau of Soils and two student assistants are now at work in Labette County, southeastern Kansas, and in Clay County, west of Manhattan.

The last legislature also passed a pure-seed law which became effective today. Prof. J. W. Zahnley has been named director of the State seed laboratory located in this department where all germination and purity tests will be made. The law will be administered under the State Board of Agriculture.

Prof. S. C. Salmon is on leave of absence for June, July, and August engaged in graduate study at the University of Minnesota.

Dr. A. M. Brunson and Dr. M. C. Sewell attended the ninth annual meeting of the Western Branch of the American Society of Agronomy on June 18-20 at Fort Collins, Colo.

The temperature in June averaged more than 30 degrees warmer than the normal. The highest was 98 degrees on the 30th; the lowest 54 degrees on the 25th. The rainfall was 6.57 inches. The mean for 60 years is 4.45 inches.

Hays Branch Experiment Station, Hays (A. F. Swanson) (No report)

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (No report)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) [June 27]

In addition to the regular field operations in the month of June, an extensive educational program was conducted. It consisted largely of demonstrations and talks at boys' and girls' club camps. The boys and girls were enthusiastic, showing great interest in the barberry and its relation to stem rust. This educational program was made possible through the cooperation of county agents and the Extension Service. Agronomy field days at Brookings and the various substations, and the convention of the South Dakota Bankers' Association also were included in the publicity program.

The entire field force began work on June 24. Second survey will constitute the major field operation this year. At present the survey is centered on two different areas, which show heavier stem-rust infection than does the surrounding territory, in an attempt to determine the source of inoculum responsible for rust in these areas. By June 20 there was a general sprinkling of stem rust over most of eastern South Dakota. Orange leaf rust appeared to be more prevalent than in the average year. A report of stem rust on wheat and barley was received on June 26 from the Black Hills region near Pringle. Conditions have been especially favorable for the development of rust since the first pustules were found on Hordeum jubatum on June 15. Spring grains have made rapid strides since June 10, and have almost recovered from the setback caused by frost and dry weather.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (June 30)

All cereal crops have made rapid progress during the past two weeks. The varieties of winter wheat and early varieties of spring wheat, oats, and barley are fully headed, being about two weeks earlier than last year. Flax varieties are beginning to blossom. Corn which was delayed by the cool weather early in the month is now growing rapidly.

Plat stakes have been set for all varieties and the entire cereal nursery, including corn, has been cultivated and hoed.

Of the wheat-rye hybrids produced last year the few plants that survived the winter are being crossed back with winter wheat.

The latter half of the month of June was comparatively hot and dry in contrast with the first half which was cool and wet. The total rainfall for the month was 4.31 inches, 4.18 inches of which fell during the first 17 days of the month. The maximum temperature for the month was 92 degrees and the minimum, 36 degrees. The surface soil is now becoming dry and a good rain would be beneficial.

The Substation was visited today by A. C. Dillman, agronomist in charge of flax investigations, and Messrs. George and Gillette, in connection with the shelter-belt work conducted by the Mandan Field Station. On June 17 the Substation was visited by W. O. Whitcomb, Superintendent of the Grain Inspection Laboratory of the Montana Agricultural Experiment Station.

The Stark County Fair will be held in Dickinson from July 1 to 4.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (July 2)

During the last half of June the weather was exceptionally favorable for growing grains, following the abundant rainfall of the earlier part of the month. Up to June 23 there was much cloudy weather and abundant rain. Since June 23 the days have been mostly clear and very warm.

Nearly all varieties in the wheat, oat, and barley varietal plats are now fully headed.

Flax sown April 15 and May 1 in the date-of-seeding-and-tillage experiment is in full bloom, and first blooms have appeared in the May 15 seeding. Heat canker is very bad in plats of flax sown June 1.

The flax varietal plats that were reseeded on June 15 emerged about June 23, but the stands were very poor as the result of packing of the soil by hard rains immediately following seeding. The flax nursery plantings and flax and cereal mixtures look exceptionally well at this time.

W. T. Craig, of Cornell University Agricultural Experiment Station, visited the Station June 18.

A. C. Dillman arrived on June 22. He found a single pustule of stem rust on Hard Federation wheat on June 23, but it was several days before more was found. The rust infection has become more general now, though not yet very severe. The fact that rust was first noted nearly a month earlier in 1925 than in 1924 might indicate the possibility of an exceptionally severe rust epidemic before harvest. The heading notes indicate that Marquis wheat is only about nine days earlier this year than in 1924.

Maximum temperature for the last half of June, 89 degrees on June 19, 20 and 30; minimum, 44 degrees on June 27; precipitation, 1.63 inches, all of which fell before June 23.

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (July 1)

Crop conditions in central Montana are very satisfactory at this date. The weather throughout June was unusually favorable for all grains.

At the Substation winter wheat and spring barley are mostly headed, while the early varieties of spring wheat and oats are heading. Weeds are more numerous than ever before, particularly tumbling and hare's ear mustard, fanweed, and wild buckwheat. A few noxious weeds such as wild lettuce are gaining a foothold.

The work performed on the cereal project in the last week of June consisted largely of note-taking, weeding the nursery, and partly staking plat and nursery material. Joe Sutherland, who will assist with the field work throughout the summer and early fall, arrived June 22.

The annual farmers' picnic at the Judith Basin Substation will be held July 23. The attendance at these picnics usually runs from 4,000 to 5,000.

The precipitation recorded in June was 4.07 inches, as compared with 3.19 inches as the average precipitation for the month. The total precipitation recorded from January 1 to June 30 was 9.13 inches, as compared with 9.19 inches as the average. The maximum temperature recorded in June was 85 degrees on the 26th and 28th, while the minimum temperature was 35 degrees on June 2, 3, 4, and 5.

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (No report)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (June 26)

Unseasonably cool weather prevailed the first two weeks in June, with minimum temperatures below freezing in many parts of eastern Oregon. On the Station, the lowest temperature was 33 degrees on June 4. Since the 18th the weather has been hot, with maximum temperatures well above 90 degrees nearly every day. On the 25th the maximum temperature reached 101 degrees, an unusually high temperature for so early in the season. There has been no rain of benefit to crops this month and all crops are suffering from drought. Unless we have rain or cooler weather soon, crop yields will not be nearly so high as was expected two weeks ago. On the lighter or shallower soils wheat already has burned so badly that there will be no grain yield.

Eastern Oregon county agents held a conference at the Station on June 22. A two-day field meeting was held at the Umatilla County grain nursery on the 16th and 17th, with an attendance of 50 on the first day and 70 on the second. The Station Field Day will be held on the 28th. The Board of Regents of Oregon Agricultural College will inspect the Station on the 30th.

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (July 2)

A trip was made yesterday by auto through parts of the rice area in Butte, Glenn, and Colusa counties. The stands of rice this year are not so satisfactory as usual, probably because of the rough seed beds and the relatively cool weather during the period of germination. Part of the rice acreage in all three counties was sown too late to make good yields.

The usual range of fields was observed, i.e.--fields sown early which have good stands and good growth; fields with very poor stands and weak growth; fields very foul with water grass, cat-tails, spike rush, etc.; and other fields on which the scum has developed and prevented the rice from emerging. While it is too early to make a satisfactory estimate of the yield per acre it probably will be less than 2,400 pounds for the State.

Barley is now being harvested in the three counties mentioned, and the heaviest crops, along the Sacramento River, are badly lodged and some also are very foul with star thistle, sun flowers, etc. However, regardless of how flat, or how weedy the fields are, the combines appear to be able to pick the crop up and thresh it, but the separation probably is poor.

Some cotton on old rice land was noticed in Colusa County. On these fields it was short and lacking in vigor as well as stand. On two fields the cotton was being crowded out by water grass and cat-tails, which are difficult to control by cultivation. Indications are that those who are trying to grow cotton on old rice land will not be entirely successful this year.

The rice at the Station is growing nicely, and except for a few varieties, the stands are satisfactory. We are nearly through pulling water grass for the first time in the varietal and nursery experiments.

The maximum temperature for June was 111°; minimum 48°; mean 73.7°, compared with a maximum of 104°, minimum of 51°, and mean of 73.6° in June, 1924. The temperature during the last half of June was very favorable for the growth and stooling of rice.

University Farm, Davis (V. H. Florell) (No report)

Agricultural Experiment Station, Berkeley (F. N. Briggs) (No report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 17

July 20, 1925
Personnel (July 11-20) and Field Station (July 1-15) Issue

PERSONNEL ITEMS

Miss Alice E. Flynn, clerk in this Office from July, 1913, to July 30, 1920, was married on June 27, 1925, to Major John Joseph McClure, at Oconomowoc, Wisconsin. Major and Mrs. McClure will be at home after the first of August at Delafield, Wis.

Dr. H. B. Humphrey, senior pathologist in charge of rust investigations, wrote as follows from St. Paul, Minn., on July 15 concerning the cereal disease conference held in Iowa, Minnesota, and North Dakota from July 6 to 14, inclusive.

We met as per schedule at Ames, where we spent a day with Doctor Melhus and his associates looking over the cereal and truck-crop plats. The plats from the standpoint of disease developments were not particularly interesting, by no means so much so as they were last summer. Doctor Melhus was of the opinion that this condition was due largely to the prolonged dry spell which characterized practically all of the month of May and part of June. The wheat and oats of Iowa are out of danger as far as concerns possible damage from rusts.

There were about forty persons assembled at Ames, and nearly all came northward by way of Albert Lea and Faribault to St. Paul, arriving Friday afternoon. Wheat, oats, and other small grain crops were, throughout the course of this journey northward, practically all out of danger of damage from rust. The oats crop, due to the drought of May and early June, is pretty generally light and short of straw. As we approached Hennepin and Ramsey Counties, however, crop conditions showed considerable improvement, and the probabilities are that many wheat fields in this vicinity and to the north of us will average around 20 bushels per acre. Many fields of wheat will run as high as twenty-five or thirty.

After spending a day inspecting the cereal and other plats at University Farm, some of the men went by automobile to Fargo, N. Dak. Others remained here and made further observations in the nursery and near-by fields. I went to Elk River and spent the day there, inspecting a forty-acre field of Marquis wheat, a portion of which had been sown about ten days earlier than the remainder. Throughout the entire 40 acres there was considerable stem rust, averaging in some instances as much as fifteen to twenty per cent. The damage likely to result from this infection will be slight, however, for the grain is too advanced in its development to suffer materially from rust.

At Fargo and throughout the Red River Valley tributary to Fargo, there has been lately altogether too much rain. Nearly 50 per cent of the potato crop, according to Director Trowbridge, has been destroyed by inundation. Much of the wheat also has been damaged from standing water. Flax looks none too well because of the early cold snaps but will, on the whole, make perhaps an average crop if conditions from now on are normal. Nearly everywhere we went throughout the Red River Valley we found rust, and in some instances there will be considerable damage. Fields of Ruby and early-sown fields of Marquis may escape with very little damage, but those fields of Marquis and other common wheats that are now but little past the blossoming period will be seriously damaged.

Dr. E. C. Stakman, O. A. Aamodt, J. Allen Clark, and I spent yesterday afternoon at Mandan, N. Dak., where we found crop conditions unusually excellent for that section of the State. Oats and wheat, and even barley, have headed at about the height of one's hips or higher. Some of the wheat in that section is already beginning to turn, and the amount of rust on any of the cereals is, so far as possible damage is concerned, negligible. Oats, wherever observed in North Dakota, were free from rust of any kind. We saw very little Helminthosporium foot rot as compared with last year. In the barley near Fargo there was some stripe, but this disease was not at all serious. Mr. Brentzel informed me that pasmo had not yet developed, and in the Red River Valley there has been this year relatively little damage from wilt. At Mandan there has been considerable damage from heat canker and a slight amount from wilt.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, returned on July 20 from Ithaca, N. Y.

F. D. Richey, agronomist in charge of corn investigations, reports that the first experimental corn plats of the season at the Arlington Experiment Farm were harvested on July 13, when crosses between an early Canadian sort and high-altitude South American corns were picked.

T. R. Stanton, agronomist in charge of oat investigations, who left July 5 on a western trip in the interests of oat investigations, wrote on July 18 from Ames, Iowa, that the oat harvest at the Agronomy Farm was nearly finished. Only a few plant rows remained to be harvested. In general, early oats were exceedingly short in the straw as the result of the drought in May and the first half of June. Midseason and late oats were benefited materially by rain occurring after June 15; they probably will outyield early oats this year. However, the very hot weather prevailing from July 1 to 15 was not especially favorable for the normal maturity of these varieties.

Corn was in excellent condition and well advanced for the season. Prospects are unusually promising for a big crop, provided the weather continues to be favorable. A severe wind and rain storm occurring rather generally over much of central Iowa on the night of July 13 did considerable damage to corn. Most of the stalks that were blown down had recovered; many sled runner stalks will remain, however.

The hay crop apparently is one of the shortest that has been harvested for some years.

L. R. Waldron, agronomist at the North Dakota Agricultural Experiment Station, was appointed collaborator, effective July 20, to assist with cereal investigations and experiments being conducted at Fargo, N. Dak., in cooperation with this Office.

MANUSCRIPTS AND PUBLICATIONS

52 A manuscript, entitled "Effect of Smut Infection on Sap Concentration in Corn Stalks," by Annie May Hurd-Karrer, was approved July 15 for publication in the American Journal of Botany.

53 A manuscript, entitled "Physiologic Specialization in the Leaf Rust of Wheat, Puccinia triticina Erikss.," by E. B. Mains and H. S. Jackson, was approved July 16 for publication in Phytopathology.

Galley proof of Department Bulletin 1356, entitled "Experiments in Rice Production in Southwestern Louisiana," by Charles E. Chambliss and J. Mitchell Jenkins, was read July 14.

Galley proof of Department Bulletin 1361, entitled "A Mosaic Disease of Winter Wheat and Winter Rye Caused by a Soil-Borne Virus," by H. H. McKinney, was read July 17.

Page proof of Department Circular 353, entitled "Improved Oat Varieties for New York and Adjacent States," by H. H. Love, T. R. Stanton, and W. T. Craig, was read July 11.

Page proof of Department Bulletin 1341, entitled "Effects of Continuous Selection for Ear Type in Corn," by H. S. Garrison and Frederick D. Richey, was read July 20.

The article, entitled "The Inheritance of Disease Resistance in Wheat and Oats," by E. F. Gaines, appears in Phytopathology, v. 15, No. 6, p. 341-349. June, 1925. (Received July 16, 1925)

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (July 20)

With the exception of a small portion of the oat nursery the threshing of the 1925 crop has been completed. The winter grain crop was good, both in yield and quality. Some varieties of wheat avera ge 63.0 pounds to the bushel without fanning. The results of the wheat varietal test are as follows:

Yield of Winter Wheat Varieties Grown in Triplicate 40th-Acre Plats
Arlington Experiment Farm, 1925

Variety	C.I.No.	Av. Yield (Bu. per Acre)	Av. Yield of 6 Nearest Check Plats 1/	Gain or Loss From Check (Bu.)
Rod Row 115	-	33.4	29.8	3.6
Wheat-rye 16-1A	-	30.6	28.6	2.0
Purplestraw	1957	38.2	37.0	1.2
Pennsylvania No. 44	6882	30.2	29.8	+.4
Illini Chief	5406	37.3	37.0	+.3
Poole	3489	29.7	29.8	-.1
Do	1979	35.6	35.7	-.1
Brown Fife	1933	31.8	31.9	-.1
Bearded Purplestraw	1911	29.1	29.8	-.7
Berkeley Rock	6941	27.6	28.6	-1.0
Mammoth Red	2008	36.0	37.0	-1.0
Leap	4323	26.7	27.8	-1.1
Fultz	1923	26.4	27.8	-1.4
China	180	28.3	29.8	-1.5
Rod Row 959	-	30.3	31.9	-1.6
Rod Row 62	-	28.2	29.8	-1.6
Dawson	6161	30.9	32.8	-1.9
Red Rock	5976	31.5	34.3	-2.8
Forward	6883	26.9	29.8	-2.9
Hybrid	3608	29.8	32.8	-3.0
Currell	3326	24.8	27.8	-3.0
Fulcaster	1945	32.6	35.7	-3.1

1/ Purplestraw C. I. No. 1915

Yield of Winter Wheat Varieties Grown in Triplicate 40th-Acre Plats
Arlington Experiment Farm, 1925. (Continued)

Variety	C.I.No.	Av. Yield (Bu. per Acre.)	Av. Yield of 6 Nearest Check Plats	Gain or Loss From Check (Bu.)
Harvest Queen	6883	25.3	28.6	- 3.3
Stoner	2980	33.4	37.0	- 3.6
German Giant	1744	30.5	34.3	- 3.8
Shepherd	6163	31.2	35.7	- 4.5
Amber Longberry	1973	27.4	31.9	- 4.5
Fulcaster	6162	31.1	35.7	- 4.6
Potomac	1735	22.8	27.8	- 5.0
Missouri Bluestem	1912	26.6	31.9	- 5.3
Hybrid	3614	28.8	34.3	- 5.5
Dietz	1981	23.6	29.8	- 6.2
Kanred	5146	18.2	32.8	-14.6

Yields of Selections Grown in Duplicate 40th-Acre Plats, Compared with Average Yield of 4 Check Plats, at the Arlington Experiment Farm, 1925

Selections	C.I.No.	Av. Yield (Bu. per A.)	Yield (Bu. per A.)	Gain or Loss From Check (Bu.)
Wheat-Rye 10	-	32.8	31.0	1.8
Rod Row 294	-	31.3	31.0	0.3
Stoner A3	-	29.9	31.0	-1.1
Theiss	-	29.3	31.0	-1.7

Yields of Selections Grown in Single 40th-Acre Plats, Compared with Average Yield of 2 Check Plats, at the Arlington Experiment Farm, 1925

Selections	C.I.No.	Av. Yield (Bu. per A.)	Yield (Bu. per A.)	Gain or Loss From Check (Bu.)
1915-B	-	34.2	30.4	3.8
1923-B	-	33.1	30.4	2.7
Wheat-Rye 5	-	28.5	30.4	-1.5
Wheat-Rye 9	-	26.7	30.4	-3.7
Wheat-Rye 6	-	26.0	30.4	-4.4

In the triplicate-plat series Rod Row 115, a brown chaffed, yellow-strawed selection, made by Dr. C. E. Leighty, tops the list in comparison with the check average. This is the second consecutive year that this selection has outyielded the Purplestraw check variety. Two wheat-rye selections, developed from natural hybrids found in Purplestraw, also are promising. Pennsylvania No. 44 continues to be one of the leading wheats in the varietal test.

1/ Purplestraw C. I. No. 1915

The wheat rod-row nursery for 1925 was the largest ever grown at Arlington Farm. In the neighborhood of 4,000 rows were harvested, the majority of which were selections made for yielding ability or leaf-rust resistance. In addition, Mr. W. J. Sando has been studying the effect of varietal competition under nursery conditions. The individual plant nursery also was increased to over 20,000 individuals in which the inheritance of several characters is being investigated.

Sterility and inheritance studies in wheat-rye hybrids have been continued, data being taken on at least 12,000 plants for the present season. Data have been obtained which furnish some basis for an explanation of the occurrence of natural wheat-rye hybrids at Arlington Farm.

Studies on natural crossing between wheat varieties, which have been in progress for several years, furnished evidence this season that natural crossing takes place in some varieties to such an extent as to interfere seriously with inheritance and other studies.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig)
(No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (July, 15)

The precipitation for June was 5.63 inches, which is 3.87 inches more than for June of last year, and 1.10 inches above the average for the past 15 years during the same period. This precipitation was of great value to the rice industry, and its beneficial effects were very noticeable in the fields a few days after the rain began falling. Although the rainfall was above normal it was not sufficient to replenish the irrigation streams. The irrigation situation is still very serious.

Samples of irrigation water taken on June 24, showed the following results:

Streams	Samples Taken at Depth of-- (feet)	Salt per Gallon (grains)
Mermentau River (At Mermentau)	5	238
	15	424
	30	519
Mermentau River (At Lake Arthur Ferry)	5	440
	15	445
	19	500
Lake Arthur (At Wharf)	5	438
Bayou Queue de Tortue	10	25

Operations on the Station progressed nicely during the past month. In spite of some engine trouble in operating the deep well, sufficient water was readily obtained for all purposes.

All rice is growing nicely, and the plats contain fewer weeds than usual. The soybean crop is exceptionally good. Rains have interfered somewhat with cultivation but they have had a very stimulating effect on the growth of beans.

In the first week of June the writer and the Extension Specialist in Rice spent three days traveling by auto between Crowley, Baton Rouge, and points on the Mississippi River, between New Roads and Lauderdale, returning by way of Houma, Morgan City, Franklin and New Iberia. In nearly all of that territory cultivated crops appeared vigerous and showed promise of an abundant harvest. The rice crop along the River, with few exceptions, did not appear to be up to normal. Most fields were very weedy. This was partly because of lack of water at time of germination, as the result of drought and the low water level in the River. Some rice also appeared to be seriously affected because the irrigation water was being held at too great a depth.

In traveling over much of the prairie section it was noted that in many fields the rice was in full head and in some it was very nearly ripe. What appeared to be damage from salt in irrigation water was very pronounced in many fields. There remained only one or two green leaves on plants in certain areas.

Interest in growing the soybean in rotation with rice is steadily increasing. In Acadia Parish there are some very attractive fields of 100 acres or more. Four soybean harvesters have been ordered for use in the vicinity of Crowley. Many farmers availed themselves of the good seasonal conditions of the latter part of June to seed soybeans. In many instances soybeans have been seeded where attempts to grow cotton had failed.

Salt, remaining in land that was irrigated last yearrwith water containing a large percentage of salt, is having a detrimental effect on soybeans. One field of over 100 acres is a total failure. Most of the plants were killed soon after the first rain following germination.

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (No report)

IOWA

Agricultural Experiment Sta tion, Ames (M. T. Jenkins) (No report)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (No report)

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (July 15)

So far this month the weather has been hot and dry. The sorghums are in better condition than might be expected.

Feterita in the earlier seedings in the date-of-seeding experiment is in head; milo and kafir in the earliest date-of-seeding experiment are begining to head. Some early maturing varieties were seeded today (July 15) for testing as catch crops.

Most of the thinning is completed, the plats have been trimmed, and counting of stands is progressing satisfactorily. The project is in good condition except for the effects of the severe drought.

Maximum temperature for July to date, 103° on the 7th; minimum 64° on the 15th; precipitation, .04 inch.

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (July 16)

Harvesting and threshing of the small grains have been completed and the corn and sorghums have been given final cultivation.

Seed from the nursery is being cleaned and weighed. A number of promising barley selections are showing up, but tabulation of the data has not been completed.

Yields of Winter Wheat in Duplicate 50th-Acre Plats on Fallow and Cropped Land at the Hays Branch Experiment Station, 1935. (Partial report)

Variety	C.I.No.	Yield (Bu. per Acre) Cropped Land	Fallow Land	Average
Blackhull	----	6.3	23.3	15.8
Kharkof (Hays No. 2)	----	5.8	22.1	14.0
Improved Turkey	5592	6.9	20.7	13.8
Kanred (Check)	----	5.4	21.7	13.5
Kanred	----	5.4	20.9	13.1
Turkey	1558	5.9	20.0	12.9
Nebraska No. 6	----	6.2	19.6	12.9
Kharkof	1442	4.3	20.5	12.6
Nebraska No. 60	----	5.2	19.6	12.4
Karment	----	5.6	13.5	12.1
Kharkof (Mont. 36)	----	6.3	17.5	11.9
Fulcaster	----	6.7	17.0	11.9
Nebraska No. 28	----	7.9	15.7	11.8
Altera	----	6.2	16.3	11.8
Sherman	----	3.8	19.0	11.4
Hussar	----	5.4	16.0	10.7
Harvest Queen	----	7.7	13.3	10.5
Minturki	----	4.8	16.0	10.4

Satisfactory showers late in June and early in July permitted some tillage operations on next year's small grain crop. The ground is dry again, however.

Maximum temperatures for the last four days have ranged from 98 to 103 degrees. The early planting of corn, which is coming into tassel and silk during this hot period, is affected by the drought. All sorghums are making rapid growth wherever the fields have been well cultivated.

Dean L. E. Call, of Manhattan, was a recent visitor at the Station.

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (No report)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) (July 10)

While stem-rust investigation was the main feature of barberry eradication in June, 173 barberry bushes were found on six properties not previously reported. All these were found as the result of following leads obtained at fairs and other demonstrations in 1924. In one instance a fairly good case of spread of stem rust to wild grass hosts was observed. Stem-rust surveys on grains and grasses, together with inspection of barberry plantings for aecial infection, were conducted in connection with travel necessary to investigate reports of barberry bushes.

Field operations in July will consist almost entirely of second survey. Severity of stem rust in certain areas constitutes the basis for assignments of territory. Sixteen Federal agents, and four field men hired by the State, were in the field at the beginning of the new fiscal year. State and Federal forces are cooperating.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (July 15)

Extremely hot weather has prevailed during the past five days, the maximum being 108 degrees on July 11. Only about one inch of rain has fallen in the past four weeks, and 0.62 inch this month. The surface soil is extremely dry and crops are ripening prematurely. The weather is cooler today and if rain should come within a few days a fair crop might yet be obtained with early sown crops.

Winter rye and winter wheat are ripening and will need to be harvested early next week if not before. All spring sown cereals are headed, and early varieties of oats and barley are ripening. Corn is making rapid progress and is beginning to tassel.

Dr. Charlotte Elliott of the Bureau of Plant Industry, spent several days at the Substation, collecting data and making counts of the percentages of infection of oat blast. A study was made of different varieties, different soil treatments, and different dates of seeding in connection with this problem. One hundred panicles of each of the 16 varieties in the oat rust nursery are being harvested for use by Doctor Elliott in the study of this disease. Doctor Elliott left the Substation on July 14.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (July 16)

During the early part of July crops have been developing very rapidly. Early varieties of oats and barley are almost ready to harvest. Early wheat varieties, and flax sown April 15, are also ripening.

Stands are very poor in the flax varietal plats, which were reseeded June 16, and weeds, especially pigeon grass, are very bad.

There is much canker in the flax nursery plantings sown the latter part of May, and in the June 1 and June 16 seedings of the date-of-seeding-and-tillage experiment, and in the flax varietal plats.

The wheat in the wheat nursery is looking exceptionally good.

A. C. Dillman left July 7 on a field trip into Minnesota and South Dakota.

J. Allen Clark arrived July 8 to study his wheat nursery plantings. He left again July 9 and returned July 15 with Messrs E. C. Stakman, O. S. Aamodt, H. [illegible] Humphrey, W. H. Tisdale, and T. F. Stoa, who came to look over the wheat plot and nursery plantings and study the rust problem at first hand. Mr. L. P. Waldron arrived July 16 for the same purpose. They found stem rust not nearly so bad as at Fargo. Rust has developed very slowly since the initial infection. Practically all of the wheat in fields in the vicinity of Mandan is fully headed, and much of it has already begun to turn. Most of it will be ripe early enough to escape serious injury from rust. There is more likelihood of damage from a continuation of the hot, dry weather such as prevailed, than from rust.

Maximum temperature for the first half of July, 101° on July 1. [illegible] 80° on July 5, 7, and 14. The precipitation for this period, which fell in [illegible] showers on July 2, 6, 7, and 12, amounted to only 0.23 of an inch.

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (July 15)

Only 0.14 of an inch of precipitation has been recorded since July 1. The drought and hot winds are seriously damaging the small grains, particularly the late maturing grains. Crop prospects are much poorer than they were two weeks ago. The early varieties of barley and oats will be ready to harvest in two or three days. Winter wheat is beginning to turn brown. Oats on the rotations are ready to harvest to-day.

The maximum temperature recorded in the first half of July was 95° on the 14th, while the minimum was 45° on the 7th.

J. Allen Clark, Agronomist in charge of western wheat investigations, is expected here on July 16.

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (No report)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell) (July 16)

Threshing of the nursery was completed today with the exception of the hybrid wheat plant selections. Yields of grain were not so high as expected but were fairly good. Quality of kernel of wheat and oats was very good in most varieties. Quite a number of barleys, on the other hand, were light and chaffy and all were badly stained.

Yields of 10 of the highest yielding varieties from each group in wheat, barley, and oats are given below:

Average Acre Yields in bushels of 10 of the Highest Yielding Wheats out of 44 Varieties Grown in the Nursery in Rod Rows Replicated Five Times at University Farm, Davis, Calif., in 1925

Variety	C.I.No.	Ser. 1:	Ser. 2:	Ser. 3:	Ser. 4:	Ser. 5:	Ave.
Hard Federation Sel.69	6645	44.8	37.4	33.4	56.0	27.6	49.8
Boadicea	6220	47.8	43.0	46.6	25.4	59.2	45.4
Federation	4734	41.6	50.6	26.2	60.6	41.8	44.2
Sonora x Cedar (Cal.No. 873)	--	43.6	33.8	46.0	48.0	44.6	43.2
Onas	6221	49.4	45.6	44.2	40.2	26.6	41.2
White Federation	4981	33.6	43.2	39.3	48.4	38.0	40.8
Sonora x Cedar (Cal.No. 903)	--	39.4	30.0	37.6	43.0	44.8	39.0
Pilcraw	5840	48.0	35.0	42.0	37.2	32.4	38.9
Preston Sel. (Kans. No. 634)	--	34.4	47.0	26.0	47.2	34.8	37.9
Hard Federation (Sel. 66)	6644	38.4	33.2	46.2	38.4	33.6	37.8
Hard Federation (Check) [a]	4733						36.8
Pacific Bluestem (Check) [a]	4067						30.3

[a] Average of 20 rows. Check variety every 10th variety.

Average Acre Yields in Bushels of 10 of the Highest Yielding Barleys out of 40 Varieties Grown in the Nursery in 20-ft. Rows Replicated Five Times at University Farm, Davis, Calif., in 1925.

Variety	C.I.No.	Ser. 1:	Ser. 2:	Ser. 3:	Ser. 4:	Ser. 5:	Ave.
Cape-Coast (Cal. No. 1527)	--	81.8	50.0	55.2	74.4	87.0	69.7
Kamaninzi (Cal. No. 667)	--	47.4	65.6	74.0	83.4	77.2	69.5
Sacramento	4108	79.8	58.0	43.0	81.2	53.8	63.2
Vaughn	1367	64.4	58.0	43.0	62.6	49.8	55.6
Trebi	936	57.0	54.8	57.0	45.2	59.0	54.8
Juliaca	1114	52.6	67.8	29.8	64.0	58.0	54.4
Tennessee Winter	257	62.0	45.8	42.4	56.2	62.4	53.8
Sea of Azov	1440	50.0	67.2	43.6	77.4	23.8	52.4
Peru	707	59.2	52.4	42.6	46.6	56.0	51.5
California Mariout (Cal. No. 2291	--	52.2	53.6	35.6	52.8	72.0	49.2
Coast [b]	690						43.7

[b] Average of 25 rows. Check variety every 10th variety.

Average Acre Yields in Bushels of 10 of the Highest Yielding Oats out of 39 Varieties Grown in the Nursery in Duplicate 15-ft. Rows at University Farm, Davis, Calif., in 1925

Variety	C.I.No.	Ser. 1:	Ser. 2:	Ave.
Ruakura	2025	68.8	118.0	93.4
Lachlan	983	73.2	108.0	90.6
Yellow Peruvian	975	58.0	65.2	61.6
Kanota	--	79.8	43.6	61.2
Burt (Sel. 916)	2054	48.0	72.0	60.0
Bathurst (Cal.No.1014)	1810	74.4	42.8	58.6
Fulghum	699-2015	36.8	76.8	56.8
Fulghum (Winter) (form)	703-204	26.0	85.2	55.6
Burt	2043	56.0	43.2	49.6
Fulghum	708	52.2	44.4	48.4

It should be noted that yields of barley were much higher in the late maturing varieties, since they were favored by the late spring rains. The same was true of wheat but not to the same extent.

The threshing of commercial fields of barley is nearing completion. On account of lodging threshing has been a very slow and expensive process this season.

Dr. Theodor Roemer, of the German Agricultural Commission, visited the Station about the middle of June.

Agricultural Experiment Station, Berkeley (No report) (F. N. Briggs)

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LIBRARY
AUG 17 1925
PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 18

July 31, 1925
Personnel (July 21-31) and Project Issue

PERSONNEL ITEMS

Dr. Carleton R. Ball, senior agronomist in charge, left Washington in the evening of July 23 en route for California. On August 4 he will speak at a meeting of the American Home Economics Association at Berkeley, Calif., on the principle and practice of cooperation. Doctor Ball also will include stops in Indiana, Illinois, Iowa, Nebraska, Utah, Oregon, Washington, Idaho, Montana, North Dakota, Minnesota, and Wisconsin to inspect cooperative cereal investigations and experiments and to consult with officials of the agricultural experiment stations in these States. On August 11 he will leave Poplar, Mont., in company with Dr. H. L. Shantz, of the Bureau of Plant Industry, Dr. O. E. Baker, of the Bureau of Agricultural Economics, and Dr. C. F. Marbut, of the Bureau of Soils, in a crop, vegetation, and soil survey of the Prairie Provinces of Canada.

J. Allen Clark, agronomist in charge of western wheat investigations, wrote from Helena, Mont., on July 22 that since leaving California on June 21 he had studied wheat experiments at Nephi, Utah, Laramie and Cheyenne, Wyo., North Platte and Lincoln, Nebr., St. Paul, Minn., Fargo, Mandan, and Dickinson, N. Dak., Redfield and Webster, S. Dak., and Moccasin and Havre, Mont.

Crop conditions in Utah were very favorable. Crops in Wyoming were late. In Nebraska early drought had caused spring wheat to head short. Rains in June helped to mature winter wheat and gave late spring varieties an apparent advantage over early varieties, this being the reverse of usual conditions. Winter wheat in Nebraska, as in Kansas, was producing low yields, but the grain was of very high quality, the protein content averaging higher than in recent years.

On the way north to Minnesota and North and South Dakota conditions seemed to improve, but as the result of hot, humid weather black stem rust had spread rapidly in the James and Red River valleys during the second week of July. Excessive heat for about a week caused heavy losses throughout the western Dakotas and Montana; at the time of writing the drought had not yet been broken. Many spring wheat fields probably will not be harvested. Because of the severe losses resulting from rust and drought many of the new hybrid productions of spring wheat, which have been bred for both earliness and rust resistance, appear to have a considerable advantage at the experiment stations where they are being tried.

F. A. Coffman, associate agronomist in oat investigations, wrote on July 19 from Aberdeen, Idaho, where he had been since the first of the month, that oats at the Aberdeen Substation looked exceptionally well in comparison with their appearance elsewhere. The oat nursery at Aberdeen is more extensive than last year. A very large series of F_3 generation plants are being studied for smut resistance. Prospects are favorable for obtaining some new smut-immune varieties. A number of strains appear to have good kernel characters and also seem to be immune to rust. Some of these are early maturing. There are nearly 50,000 plants to select from. For about ten days Mr. Coffman had been attempting to make crosses, in spite of unfavorable weather conditions.

Before his arrival at Aberdeen Mr. Coffman had visited the experiment stations at Ames, Ia., Lincoln and North Platte, Nebr., Hays and Manhattan, Kans., Akron and Fort Collins, Colo., and Logan, Utah. In most of the Great Plains area dry weather early in the spring had reduced crop estimates. Very low yields of early cereals were harvested at several stations, and probably the later maturing crops fared better in most sections than those maturing early.

Dr. H. B. Humphrey, senior pathologist in charge of rust investigations, left July 31 for Ithaca, N. Y., to consult with pathologists of Cornell University Agricultural Experiment Station. On Monday morning, August 3, he expects to be joined at Guelph, Ontario, by Dr. E. C. Stakman, of University Farm, St. Paul, Minn., and together they are to visit Canadian pathologists at Guelph and Ottawa, Ontario; Montreal, Quebec, and Ste. Anne de la Pocatiere, Quebec; Kentville, Nova Scotia; and Charlottetown, Prince Edward Island. Doctor Humphrey also will go to Presque Isle and Orono, Me., and Burlington, Vt., and will be back in Washington about August 22.

Christian Larson, recently appointed Director of Extension in South Dakota, vice Wendell F. Kumlien, was appointed collaborator with this Office, effective July 25, in order that his advice and services may be available in connection with cooperative barberry eradication in South Dakota.

H. H. McKinney, associate pathologist in the cooperative cereal disease investigations at Madison, Wis., was in Washington July 24 and 25 to confer with the senior pathologist in charge of cereal disease investigations.

Lester J. Sand, assistant clerk to J. R. Holbert, in charge of investigations of corn root, stalk, and ear rots in cooperation with Funk Brothers Seed Company at Bloomington, Ill., resigned at the termination of July 31.

VISITORS

Prof. Lester Briggle, who has been connected with the Woman's College at Constantinople for the past six years, was an Office visitor on July 29. Professor Briggle will return to Turkey the middle of September and will be located at Angora, Turkey where he will be connected with the Turk-American Association in the capacity of agricultural adviser. His mail address is American Embassy, Constantinople, Turkey.

Professor Briggle's visit to the Department was for the purpose of establishing contacts with agricultural workers. Such contacts should be mutually helpful as Prof. Briggle will be in position to supply seeds and plants native to Turkey and to assist materially any agriculturist who may visit that country. He desires to receive publications that may be of use in connection with his agricultural investigations in Turkey. Any assistance in this or other respects will be much appreciated.

MANUSCRIPTS AND PUBLICATIONS

54 A manuscript, entitled "Climatic Effects in the Metabolism of the Sugar Beet," by W. E. Tottingham, S. Lepkovsky, E. R. Schulz, and K. P. Link, was approved for publication on July 22.

Page proof of Department Bulletin 1334, entitled "Tests of Barley Varieties in America," by H. V. Harlan, Mary L. Martini, and M. N. Pope, was read July 29.

Page proof of Department Bulletin 1361, entitled "A Mosaic Disease of Winter Wheat and Winter Rye Caused by a Soil-Borne Virus," by H. H. McKinney, was read July 29.

Second page proof of Department Bulletin 1284, entitled "Sorghum Smuts and Varietal Resistance in Sorghums," by George M. Reed and Leo E. Melchers, was read July 29.

PUBLICATIONS

OFFICE OF CEREAL INVESTIGATIONS

July 1, 1924, to June 30, 1925

The following is a list of 94 papers published during the fiscal year ended June 30, 1925, in the various series of Departmental publications, in publications of the cooperating State departments of agriculture and agricultural experiment stations, and in private journals.

CEREALS

Research Fundamental to the Solving of Crop-Plant Problems, by C. R. Ball. In Jour. Amer. Soc. Agron. 16: 553-556. September, 1924.

1a. Taxonomy, by C. R. Ball. In Jour. Amer. Soc. Agron. 16: 556-566. September, 1924.

Some Elements of Successful Cooperation in Research, by C. R. Ball. Mimeographed, 43 p. May, 1925.

Investigations with Flax and Cereals [at the Northern Great Plains Field Station], by J. C. Brinsmade, Jr. In U. S. Dept. Agr. Bul. 1301, p. 65-67. March, 1925.

Experiments with Cereals at the Akron (Colo.) Field Station in the 15-Year Period, 1908 to 1922, Inclusive, by F. A. Coffman. U. S. Dept. Agr. Bul. 1287. March, 1925.

A Handy Pollen Carrier, by C. E. Leighty and W. J. Sando. In Jour. Heredity 16: 63-65. February, 1925.

The Principles of Summer-Fallow Tillage, by M. A. McCall and H. M. Wanser. Wash. Agr. Exp. Sta. Bul. 183. October, 1924.

Dry-Farm Crop-Rotation Experiments at Moro, Oregon, by D. E. Stephens. Oreg. Agr. Exp. Sta. Bul. 209. September, 1924.

Spring Crops for Eastern Oregon, by D. E. Stephens, R. Withycombe and O. Shattuck. Oreg. Agr. Exp. Sta. Bul. 204. May, 1924.*

Experiments with Small Grains on the Arlington Experiment Farm, by J. W. Taylor. U. S. Dept. Agr. Bul. 1309. March, 1925.

Barley

The Germination of Barley Under Late Spring Malting Conditions in India, by H. V. Harlan. Science 61: 566-567. May 29, 1925.

Some Cases of Apparent Single Fertilization in Barley, by H. V. Harlan and M. N. Pope. In Jour. Bot. 12: 50-53. January, 1925.

Albinism in Barley, by G. A. Wiebe. In Jour. Heredity 15: 221-222. May, 1924.*

Corn and Sorghums

Heritable Characters of Maize.--XX. Iojap-Striping, a Chlorophyll Defect, by M. T. Jenkins. (With Ia. Agr. Exp. Sta.) In Jour. Heredity 15: 467-472. November, 1924.

Physiological Studies on Cereals.--III. The Occurrence of Polypetides and Amino Acids in the Ungerminated Maize Kernel, by S. L. Jodidi. (With Office of Plant Phys. and Fermentation Inves., B. P. I.) In Jour. Agr. Research 30: 587-592. March 15, 1925.

Carbohydrate Storage in the Endosperm of Sweet Corn, by L. Lampe and M. T. Meyers. (With Ohio State University.) In Science 61: 290-291. March, 13, 1925.

Handling the Soft-Corn Crop, by F. D. Richey. U. S. Dept. Agr. Circ. 333. October, 1924.

Corn Judging and the Productiveness of Corn, by F. D. Richey. In Jour. Amer. Soc. Agron. 17: 313-318. June, 1925.

A Statistical Study of the Relation Between Seed Ear Characters and Productiveness in Corn, by F. D. Richey and J. G. Willier. U. S. Dept. Agr. Bul. 1321. March, 1925.

A Program of Corn Improvement, by C. M. Woodworth. Ill. Agr. Exp. Sta. Circ. 284. July, 1924.

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Oats

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* Not received until fiscal year ended June 30, 1925.

PROJECT REPORTS

RUST INVESTIGATIONS

(Dr. H. B. Humphrey, Senior Pathologist in Charge)

Report of Progress in Barberry Eradication for the Fiscal Year Ending June 30, 1925.

Dr. F. E. Kempton, Associate Pathologist in Charge,
and Lynn D. Hutton, Associate Pathologist.

The campaign to remove all of the common barberry bushes in the 13 north-central grain-growing States has completed its seventh full year. Some preliminary publicity and survey was done in the spring of 1918, but the actual survey for barberries began July 1, 1918. On that date $150,000, the first federal appropriation specifically for barberry eradication, became available for the fiscal year 1919. The annual appropriation for each of the following three fiscal years, 1920, 1921, and 1922, was about $150,000. For the fiscal year 1923, the amount of the appropriation was increased to $350,000 and for the following fiscal year, 1924, a further increase to $425,000 was made. Of the latter amount, however, $125,000 became available only when an equal amount was furnished by the cooperating States and other agencies. For the fiscal year 1925, the amount of appropriation was $300,000 plus a restricted item of $111,315. This latter amount was matched by cooperating agencies making the total sum available from Federal sources, $411,315.

The State agricultural colleges of the 13 States, the State departments of agriculture in most of the States, the Conference for the Prevention of Grain Rust, and similar allied agricultural and business organizations cooperated in the campaign. The work in each State is supervised by a State leader who makes contacts with the cooperating agencies, directs the field and publicity activities, supervises and coordinates the four phases of the campaign, namely, investigations, publicity, surveys, and eradications.

INVESTIGATIONS

The different lines of investigation were (1) stem-rust epidemiology studies (2) classification of barberries and mahonias, (3) susceptibility of barberries and mahonias to stem rust, (4) chemical studies, and (5) observationsin Kansas and Missouri.

Stem-Rust Epidemiology Studies

The field agents in barberry eradication continued to cooperate in the stem-rust epidemiology studies. These studies were conducted in all of the States of the eradication area and in the other principal grain-growing States.

The following are some of the outstanding results: (1) The uredinospores of stem rust did not overwinter in the barberry eradication area; (2) aeciospores developed on common barberries within the eradication area about a month previous to the appearance of stem rust on grains and grasses; (3) grains and grasses near infected barberries became rusted from two to three weeks before stem rust appeared on similar grains and grasses farther from the infected barberries; (4) in 1924 the severe stem-rust infection on spring wheat in central North Dakota was immediately traceable to about 80 barberry bushes near Jamestown, which had been overlooked in the original survey; (5) the occurrence of stem rust on oats over an area more than 60 miles long in western Wisconsin in 1924 was directly traceable to infected barberries in the area of escaped bushes near Tremp ealeau

At the beginning of the campaign, before great numbers of barberries were removed it was nearly impossible to differentiate between the local stem-rust epidemics which the infected barberries caused. Now that so many millions of t hese bushes have been removed the local epidemics are greatly reduced in number and are much more easily distinguished. Within the last year it has been possible to find great numbers of barberry bushes by tracing stem-rust epidemics from areas of light infection to areas of heavier infection until the source of the epidemic was reached. It seems very probable that when the barberry population in the 13 States is reduced to such a minimum that each local epidemic can be clearly isolated from the other epidemics each common barberry eventually will reveal its location in a year favorable to the production and spread of stem rust.

Classification of Barberries and Mahonias

During the year numerous foreign and native species and strains of barberries and mahonias have been added to the Berberis garden at Bell, Maryland, which is continued in cooperation with the Office of Horticultural Investigations. These are being assembled for description and classification. Native species of barberries also are being studied in their natural habitat.

The American barberry, Berberis canadensis Miller, which was found along the Tippecanoe River in Indiana in 1923, also was found near Spring Lake not far from the Illinois River, in Tazewell County, Ill., in 1924.

Susceptibility of Barberries and Mahonias to Stem Rust

All species and strains of barberry and mahonia obtainable are being assembled and tested for susceptibility to infection by the various varieties and physiologic forms of black stem rust. The results obtained will determine which of the numerous varieties of barberries are immune and may be planted in the eradication area. These investigations are carried on at St. Paul, Minn., in cooperation with the Minnesota Agricultural Experiment Station.

Chemical Studies

The investigations begun in September, 1921, to determine the most satisfactory chemicals with which to kill the common barberry were discontinued at the end of the fiscal year 1925. Approximately 40 different chemicals were tested under laboratory and field conditions. It was demonstrated that common crushed rock salt and kerosene are, in every respect, the two most satisfactory chemicals with which to kill common barberry. The use of sodium arsenite, which for a time was recommended, was discontinued because of the danger of live-stock poisoning. Either salt or kerosene is 100 per cent effective if properly applied; the cost and application of either chemical are considerably cheaper than eradication by digging. The availability of both salt and kerosene makes them especially satisfactory.

Chemical studies also have been made of (1) the effects of sodium arsenite and the effects of salt when used to kill the common barberry; (2) the relation of seasonal storage of reserve food products in the different parts of the barberry plant to the time of year for effective treating with chemicals; (3) the sterilizing effects of salt on soil; and (4) analyses of barberry tissues for alkaloids and glucosides, with methods for their extraction.

Observations in Kansas and Missouri

In July and August, 1924, field agents made a thorough original survey of certain selected localities in 12 northern and northeastern counties of Missouri, and 9 northern counties of Kansas. The purpose of this survey was (1) to determine how widely and in what numbers common barberries are distributed in those counties; (2) to determine how abundantly the barberries were rusted; and (3) to determine if stem rust had spread from barberries to grains and grasses.

The counties selected were those adjacent to States of the barberry eradication area, or counties a little farther south in which exceptionally large acreages of small grain are grown. A few representative townships were surveyed in each county. In Kansas an average of 22 per cent, or an average of 764 square miles, of each county was surveyed and an average of 7 plantings, or 129 bushes, was found in each of these counties. In Missouri an average of 40 per cent, or an average of 575 square miles, was surveyed and an average of 8.4 plantings, or 105.4 bushes, was found in each county. In both Kansas and Missouri some barberries were found in every county in which survey was made.

The observations for stem rust on barberries necessarily were made after July 1, and most of the infection was dried up when examined by the field men. In Missouri aecial infection was found on 129 barberry bushes in nine counties distributed rather generally over the northern part of the State. Owing to the late date of survey only one instance of stem-rust infection on grains and grasses was directly traceable to infected barberries. This was at Ridgeway, in Harrison County.

In Kansas 47 rural and 17 city properties having barberries were located. The bushes on 16 of the rural properties were quite heavily rusted. The survey in Kansas was not started until August 1, and it was not possible at that time to determine if the infected barberries had been instrumental in the spread of stem rust. Farmers in many cases did not know that barberry bushes were capable of spreading stem rust and could give very little information on this point. However, they did report severe stem-rust infections in past years on grains which were near barberry bushes.

PUBLICITY

Barberry eradication has been especially emphasized in the schools during the fiscal year. With the cooperation of Smith-Hughes instructors and school superintendents and teachers, many school children have been taught to identify the harmless Japanese barberry, the harmful common barberry, and the different stages of black stem rust.

Since the beginning of the eradication campaign about 1,825,000 copies of bulletins, circulars, and posters of the United States Department of Agriculture have been distributed in the 13 States. About 225,000 were distributed this year. The cooperating commercial agency, the Conference for the Prevention of Grain Rust, has printed and distributed over two million copies of bulletins, circulars, and posters since its organization in 1921. Publicity material also has been put out by the State departments of agriculture, and the Extension Divisions of the State colleges of agriculture have cooperated in printing and distributing educational literature. One or more State bulletins on barberry eradication have been printed and distributed on State funds by each of the States in the eradication area.

Circular letters were sent to all property owners in each of the counties to be covered by the farm-to-farm survey before the survey was started. This was done so that every property owner would have definite knowledge of the purpose of the campaign before the field assistants visited his premises.

SURVEYS

Types of Surveys

Survey activities are divided into three phases, namely, original survey, second survey, and resurvey.

The original survey is a p roperty-by-property survey in cities, towns, and villages and a farm-by-farm survey in the country. During the year the original farm-to-farm and city survey was completed in Colorado, Indiana, Iowa, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin. The original survey is very largely completed in Illinois, Michigan, Montana, and Ohio. The survey in Wyoming was finished in 1923. Only about 103 counties out of 895 remain to be covered by original survey.

A second survey now means a second complete original survey of every foot of every rural and city property on which barberries may possibly be growing. A second survey is necessary to locate bushes, escaped bushes, and seedlings which were missed on the original survey. The larger number of bushes found on second survey were those that had been cut down by property owners previous to the original survey and had grown again. It apparently will be necessary to cover by second survey all of the counties in which fruiting bushes have been found. Second survey results indicate that every wood lot, tree claim, and grove must be scouted foot by foot to insure finding every barberry bush. The second complete survey was conducted in 60.5 counties during the year. In all, 115.5 counties have been covered by the second survey.

A resurvey is a revisit to the properties on which barberries have previously been found and eradicated. Two years after the bushes are eradicated the properties are reinspected and sprouts and seedlings are removed to prevent the possibility of their becoming infected and starting anew the stem-rust epidemics. These resurveys have been combined with the second survey whenever practicable.

The Use of Government-owned Trucks on Surveys

City and town properties are surveyed on foot and there is very little necessity for the use of automobiles or trucks in city surveys except to transport field men between small towns where train services are poor. Motor vehicles are used in surveying rural properties because of the distances to be traveled and the necessity of carrying shovels and chemicals with which to eradicate barberries.

In order to reduce transportation costs to a minimum, the Office of Cereal Investigations purchsed 52 light trucks in 1923. These can be owned and operated somewhat more cheaply than they can be rented and operated. The greatest disadvantage of Government-owned trucks is the depreciation and storage cost throughout the winter months. Table No. 18 gives a summary of the operation costs of 20 Government-owned trucks which were used for two years and then traded in as part payment for new trucks.

Barberry eradication is essentially a seasonal project and the maximum number of men are employed in June, July, and August. During these months automobiles are rented; it is more economical to do this than to purchase the necessary number of trucks for such a short period.

ERADICATION

Methods of Eradication

Although salt and kerosene are very satisfactory as killers for barberries their use has not entirely replaced digging. When the barberry bush is close to valuable plants or trees it is dug or pulled because of the possibility of damaging the other plants by an application of chemicals. Many seedlings and small escaped bushes are not treated since the entire root system can be pulled easily.

On original survey and second survey during the fiscal year 1925, 240,832 bushes were treated and 145,582 dug. The ease with which seedlings are pulled made it necessary to treat only 94,158 seedlings of the 671,772 destroyed on these surveys. On resurvey during the year, 14,636 sprouting bushes out of a total of 21,092, and 78,302 seedlings in 131,393 were treated. The percentage of treated seedlings on resurvey is higher than on original survey, because by the time of resurvey the missed seedlings have grown to a size where they can not well be pulled. During the fiscal year 304.5 tons of salt and 11,957 gallons of kerosene were used to kill 427,914 barberry bushes, sprouting bushes, and seedlings on 2,651 properties.

Escaped bushes

A determined effort has been made during the fiscal year to discover and treat all escaped barberries. One of the outstanding discoveries of the year's work is that areas of escaped bushes in nearly every instance are larger than was at first supposed. It has been necessary to survey several miles in every direction from hedges of fruiting barberries. Where the escaped bushes also are fruiting the method is to survey foot by foot at least two miles beyond the limit of the last fruiting escaped bush. Seedlings continue to appear every spring near the sites of hedges destroyed several years before, indicating that seeds lying on the surface of the ground retain their viability as long as six or seven years. A total of 3,860,402 escaped bushes and 4,631,929 seedlings has been found to date. Of these, 259,733 escaped bushes and 806,451 seedlings have been found this year.

SUMMARY

During the fiscal year approximately 124 counties were covered in the original survey, approximately 60 were surveyed a second time, and the equivalent of 220 counties was covered in resurvey. On original survey 294,760 bushes were found on 5,528 properties and 386,414 bushes were eradicated from 6,443 properties. These figures include 5,327 bushes on 779 properties found in the second survey. On resurveys, 21,058 spouting bushes were found and 21,092 were eradicated. Seedlings numbering 806,451 were found on original, second survey, and resurvey. This makes a grand total for the fiscal year of 1,122,269 bushes, seedlings, and sprouting bushes and 1,210,671 destroyed. The grand total of bushes, sprouting bushes, and seedlings found during the entire campaign is 11,277,387. Of these, 10,679,692 have been destroyed.

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ORIGINAL SURVEY, PROPERTIES, JULY 1, 1924, to JUNE 30, 1925

Table 1. Data showing, by States, the number of properties on which barberry bushes were found and destroyed in all surveys, and the number of properties upon which seedlings were found and destroyed in original and second surveys during the fiscal year July 1, 1924, to June 30, 1925

State	Number of counties covered in original survey	Number of properties on which bushes were found--				Total number of properties cleared of bushes			Number of properties on which seedlings were--			
		In cities and towns	In country		Total in cities and country	Dug	Treated	Total	Found	Destroyed		
			Having escaped bushes	Total						Dug	Treated	Total
Colorado	0	3	4	11	14	3	9	12	0	0	0	0
Illinois	18.85	1,003	215	687	1,690	1,507	475	1,982	67	53	14	67
Indiana	22.00	149	86	178	327	178	177	355	25	10	15	25
Iowa	7.00	53	90	216	269	102	171	273	18	4	14	18
Michigan	21.40	262	262	539	801	891	304	1,195	150	142	8	150
Minnesota	0	37	40	132	169	64	105	169	21	7	14	21
Montana	8.27	26	6	23	49	32	16	48	1	1	0	1
Nebraska	0	20	21	78	98	25	74	99	7	3	4	7
North Dakota	4.00	12	0	25	37	9	28	37	0	0	0	0
Ohio	18.35	931	214	650	1,581	1,440	313	1,753	41	0	41	41
South Dakota	2.00	42	2	32	74	22	63	85	1	0	1	1
Wisconsin	22.00	189	121	230	419	283	152	435	43	21	14	35
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	123.87	2,727	1,061	2,801	5,523	4,556	1,887	6,443	374	241	125	366

ORIGINAL SURVEY, BUSHES AND SEEDLINGS, JULY 1, 1924, TO JUNE 30, 1925

Table 2. Data showing, by States, the number of barberry bushes found and destroyed in all surveys, and the number of seedlings found and destroyed in original and second surveys during the fiscal year July 1, 1924, to June 30, 1925

State	Number of bushes found--				Number of bushes destroyed			Number of seedlings			
	In cities and towns	In country		Total	Dug	Treated	Total	Found	Destroyed		
		Escaped	Total						Dug	Treated	Total
Colorado	11	107	173	184	55	118	173	0	0	0	0
Illinois	7,260	76,829	84,466	91,726	23,530	80,328	103,858	12,212	8,808	3,404	12,212
Indiana	731	48,757	49,482	50,213	621	76,684	77,305	7,346	159	7,187	7,346
Iowa	484	3,152	4,485	4,969	1,535	3,525	5,060	841	144	697	841
Michigan	1,332	115,228	116,601	117,933	65,866	64,951	130,817	600,050	562,422	37,628	600,050
Minnesota	287	1,159	1,777	2,064	346	1,718	2,064	649	299	350	649
Montana	129	135	240	369	750	261	1,011	167	167	0	167
Nebraska	147	282	750	897	220	664	884	1,077	525	552	1,077
North Dakota	36	0	302	338	31	307	338	0	0	0	0
Ohio	6,653	7,492	10,622	17,275	11,389	8,372	19,761	37,955	0	37,955	37,955
South Dakota	538	5	368	906	410	883	1,293	70	0	70	70
Wisconsin	789	6,587	7,097	7,886	40,829	3,021	43,850	14,691	5,090	6,315	11,405
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	18,397	259,733	276,363	294,760	145,582	240,832	386,414	675,058	577,614	94,158	671,772

Table 3. Data showing, by States, the number of properties on which barberry bushes were found and destroyed in all surveys, and the numbers of properties upon which seedlings were found and destroyed in original and second surveys, April 1, 1918, to June 30, 1925

State	Number of counties covered by original survey	Number of properties on which bushes were found--				Total number of properties cleared of bushes:			Number of properties on which seedlings were--			
		In cities and towns	In country		Total in cities and country	Dug	Treated	Total	Found	Destroyed		
			Having escaped bushes	Total						Dug	Treated	Total
Colorado	31.49	1,546	59	164	1,710	1,646	61	1,707	0	0	0	0
Illinois	46.25	10,080	997	2,559	12,639	11,471	1,168	12,639	135	95	40	135
Indiana	92.00	3,582	315	1,188	4,770	4,361	391	4,752	40	19	21	40
Iowa	99.00	7,011	691	2,567	9,578	8,967	610	9,577	44	23	21	44
Michigan	52.40	5,045	1,565	5,173	10,218	8,904	627	9,531	382	335	47	382
Minnesota	85.33	3,146	457	1,890	5,036	4,865	171	5,036	364	345	19	364
Montana	22.59	196	10	74	270	242	26	268	2	1	1	2
Nebraska	92.50	3,191	90	689	3,880	3,653	217	3,870	18	4	14	18
North Dakota	53.00	523	1	316	839	754	85	839	2	1	1	2
Ohio	69.10	7,487	437	2,229	9,716	9,148	486	9,634	55	12	43	55
South Dakota	69.00	488	108	553	1,041	794	247	1,041	88	81	7	88
Wisconsin	71.00	6,901	1,047	2,718	9,619	8,752	772	9,524	130	50	65	115
Wyoming	8.00	74	1	14	88	84	1	85	0	0	0	0
Total	791.66	49,270	5,778	20,134	69,404	63,641	4,862	68,503	1,260	966	279	1,245

ORIGINAL SURVEY, BUSHES AND SEEDLINGS, APRIL 1, 1918, TO JUNE 30, 1925

Table 4. Data showing, by States, the number of barberry bushes found and destroyed in all surveys, and the numbers of seedlings found and destroyed in original and second surveys, April 1, 1918, to June 30, 1925

State	Number of bushes found--				Number of bushes destroyed			Number of seedlings--			
	In cities and towns	In country		Total	Dug	Treated	Total	Found	Destroyed		
		Escaped	Total						Dug	Treated	Total
Colorado	19,597	2,653	4,811	24,408	23,884	512	24,396	0	0	0	0
Illinois	108,996	127,729	167,453	276,449	169,969	106,480	276,449	1,530,660	16,972	1,513,688	1,530,660
Indiana	77,393	103,703	118,596	195,989	97,718	97,366	195,084	8,040	755	7,285	8,040
Iowa	649,292	58,316	142,831	792,123	773,129	18,990	792,119	3,221	730	2,491	3,221
Michigan	53,832	345,476	414,841	468,673	365,990	79,442	445,432	783,148	712,694	70,454	783,148
Minnesota	592,447	81,317	192,052	784,499	780,266	4,233	784,499	20,309	19,584	725	20,309
Montana	6,905	883	3,315	10,220	9,562	644	10,206	812	167	645	812
Nebraska	73,081	5,717	21,309	94,390	90,467	3,887	94,354	7,245	925	6,320	7,245
N. Dakota	14,404	150	7,757	22,161	19,569	2,592	22,161	156	150	6	156
Ohio	215,497	32,111	48,343	263,840	241,395	18,257	259,652	38,791	276	38,515	38,791
S. Dakota	23,668	20,727	35,645	59,313	48,800	10,513	59,313	17,258	16,579	679	17,258
Wisconsin	280,658	3,081,619	3,093,287	3,373,945	2,844,817	19,219	2,864,036	35,139	10,266	16,687	26,953
Wyoming	3,946	1	196	4,142	3,966	2	3,968	0	0	0	0
Total	2,119,716	3,860,402	4,250,436	6,370,152	5,469,532	362,137	5,831,669	2,444,779	779,098	1,657,495	2,436,593

SECOND SURVEY, PROPERTIES, JULY 1, 1924, TO JUNE 30, 1925

Table 5. Data showing, by States, the number of properties on which barberry bushes and seedlings were found and destroyed on second survey in the barberry eradication campaign during the fiscal year July 1, 1924, to June 30, 1925

State	Number of counties surveyed	Number of properties on which bushes were found--				Total number of properties cleared of bushes			Number of properties on which seedlings were--			
		In cities and towns	In country		Total in cities and country	Dug	Treated	Total	Found	Destroyed		
			Having escaped bushes	Total						Dug	Treated	Total
Colorado	3.50	0	0	2	2	0	2	2	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0	0	0
Indiana	.15	68	0	2	70	69	1	70	1	1	0	1
Iowa	4.00	10	46	81	91	25	66	91	12	1	11	12
Michigan	3.00	49	38	75	124	78	46	124	4	4	0	4
Minnesota	12.00	28	36	123	151	49	102	151	18	4	14	18
Montana	6.00	0	0	1	1	1	0	1	0	0	0	0
Nebraska	9.50	19	21	80	99	27	74	101	7	3	4	7
N. Dakota	10.95	7	0	21	28	7	21	28	0	0	0	0
Ohio	2.00	18	0	7	25	24	1	25	0	0	0	0
S. Dakota	6.73	21	0	16	37	8	29	37	0	0	0	0
Wisconsin	2.60	57	50	94	151	83	68	151	11	5	6	11
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	60.43	277	191	502	779	371	410	781	53	18	35	53

SECOND SURVEY, BUSHES AND SEEDLINGS, JULY 1, 1924, TO JUNE 30, 1925.

Table 6. Data showing, by States, the number of barberry bushes and seedlings found and destroyed on second survey in the barberry eradication campaign during the fiscal year July 1, 1924, to June 30, 1925

State	Number of bushes found--				Number of bushes destroyed:			Number of seedlings--			
	In cities and towns	In country		Total	Dug	Treated	Total	Found	Destroyed		
		Escaped	Total						Dug	Treated	Total
Colorado	0	0	2	2	0	2	2	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0	0
Indiana	253	0	7	260	261	1	262	3	3	0	3
Iowa	83	337	775	858	189	669	858	522	30	492	522
Michigan	96	339	438	534	262	272	534	240	240	0	240
Minnesota	200	436	967	1,167	243	924	1,167	618	268	350	618
Montana	0	0	1	1	1	0	1	0	0	0	0
Nebraska	146	282	776	922	434	664	1,098	1,077	525	552	1,077
North Dakota	27	0	276	303	28	275	303	0	0	0	0
Ohio	59	0	31	90	88	2	90	0	0	0	0
South Dakota	56	0	149	205	16	189	205	0	0	0	0
Wisconsin	209	675	776	985	180	805	985	6,789	3,269	3,520	6,789
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	1,129	2,069	4,198	5,327	1,702	3,803	5,505	9,249	4,335	4,914	9,249

Table 7. Data showing, by States, the number of properties on which barberry bushes and seedlings were found and destroyed on second survey in the barberry eradication campaign from January 1, 1922, to June 30, 1925

State	Number of counties surveyed	Number of properties on which bushes were found--				Total number of properties cleared of bushes			Number of properties on which seedlings were--			
		In cities and towns	In country		Total in cities and country	Dug	Treated	Total	Found	Destroyed		
			Having escaped bushes	Total						Dug	Treated	Total
Colorado	15.69	0	15	27	27	3	24	27	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0	0	0
Indiana	4.15	95	2	22	117	98	18	116	1	1	0	1
Iowa	6.00	12	62	110	122	31	90	121	13	1	12	13
Michigan	3.00	49	38	75	124	78	46	124	4	4	0	4
Minnesota	30.00	50	46	200	250	127	123	250	21	6	15	21
Montana	6.00	0	0	1	1	1	0	1	0	0	0	0
Nebraska	15.00	45	28	128	173	47	124	171	11	3	8	11
North Dakota	20.45	10	0	52	62	12	50	62	1	0	1	1
Ohio	2.00	18	0	7	25	24	1	25	0	0	0	0
South Dakota	9.97	27	0	29	56	8	48	56	1	1	0	1
Wisconsin	3.40	61	69	122	183	92	91	183	13	7	6	13
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	115.66	367	260	773	1,140	521	615	1,136	65	23	42	65

SECOND SURVEY, BUSHES AND SEEDLINGS, JANUARY 1, 1922, TO JUNE 30, 1925

Table 8. Data showing, by States, the number of barberry bushes and seedlings found and destroyed on second survey in the barberry eradication campaign from January 1, 1922, to June 30, 1925

State	Number of bushes found--				Number of bushes destroyed			Number of seedlings--			
	In cities and towns	In country		Total	Dug	Treated	Total	Found	Destroyed		
		Escaped	Total						Dug	Treated	Total
Colorado	0	43	75	75	6	69	75	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0	0
Indiana	305	15	92	397	324	70	394	3	3	0	3
Iowa	85	497	995	1,080	198	879	1,077	547	30	517	547
Michigan	96	339	438	534	262	272	534	240	240	0	240
Minnesota	318	778	2,441	2,759	1,472	1,287	2,759	711	300	411	711
Montana	0	0	1	1	1	0	1	0	0	0	0
Nebraska	468	376	1,796	2,264	560	1,687	2,247	1,495	525	970	1,495
North Dakota	64	0	1,367	1,431	64	1,367	1,431	3	0	3	3
Ohio	59	0	31	90	88	2	90	0	0	0	0
South Dakota	266	0	819	1,085	44	1,041	1,085	400	400	0	400
Wisconsin	214	758	897	1,111	211	900	1,111	7,189	3,669	3,520	7,189
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	1,875	2,806	8,952	10,827	3,230	7,574	10,804	10,588	5,167	5,421	10,588

Table 9. Data showing, by States, the number of properties on which sprouting bushes and seedlings were found and destroyed on resurvey in the barberry eradication campaign during the fiscal year July 1, 1924, to June 30, 1925

State	Number of properties on which sprouting bushes were found--				Total number of properties cleared of sprouting bushes			Number of properties on which seedlings were--			
		In country		Total in cities and country					Destroyed		
	In cities and towns	Having escaped bushes	Total		Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	31	24	32	63	1	62	63	39	1	38	39
Illinois	94	65	154	248	120	128	248	59	56	3	59
Indiana	7	9	10	17	7	10	17	6	0	6	6
Iowa	46	83	290	336	138	198	336	76	48	28	76
Michigan	26	15	26	52	39	13	52	19	18	1	19
Minnesota	25	54	124	149	69	80	149	58	25	33	58
Montana	16	1	10	26	19	8	27	8	8	0	8
Nebraska	9	1	19	28	11	16	27	5	4	1	5
North Dakota	28	0	36	64	14	50	64	1	0	1	1
Ohio	443	43	262	705	659	46	705	172	165	7	172
South Dakota	29	14	47	76	8	68	76	22	2	20	22
Wisconsin	50	72	141	191	101	91	192	62	42	20	62
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	804	381	1,151	1,955	1,186	770	1,956	527	369	158	527

RESURVEY, SPROUTING BUSHES AND SEEDLINGS, JULY 1, 1924, TO JUNE 30, 1925

Table 10. Data showing, by States, the number of sprouting bushes and seedlings found and destroyed on resurvey in barberry eradication campaign during the fiscal year July 1, 1924, to June 30, 1925

State	Number of sprouting bushes found--				Number of sprouting bushes destroyed			Number of seedlings--			
	In cities and towns	In country		Total	Dug	Treated	Total	Found	Destroyed		
		Escaped	Total						Dug	Treated	Total
Colorado	82	282	426	508	14	494	508	712	3	709	712
Illinois	923	533	2,984	3,907	1,043	2,864	3,907	31,650	29,895	1,755	31,650
Indiana	14	46	48	62	14	48	62	195	0	195	195
Iowa	205	1,050	3,114	3,319	695	2,621	3,316	4,291	2,678	1,613	4,291
Michigan	126	101	142	268	134	134	268	65,686	5,686	60,000	65,686
Minnesota	156	642	1,148	1,304	313	991	1,304	6,620	357	6,263	6,620
Montana	111	3	312	423	381	62	443	265	265	0	265
Nebraska	18	25	121	139	54	102	156	130	128	2	130
North Dakota	127	0	722	849	45	804	849	1	0	1	1
Ohio	2,047	528	1,444	3,491	2,844	647	3,491	12,513	10,393	2,120	12,513
South Dakota	270	63	205	475	10	465	475	651	224	427	651
Wisconsin	165	5,511	6,148	6,313	909	5,404	6,313	8,679	3,462	5,217	8,679
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	4,244	8,784	16,814	21,058	6,456	14,636	21,092	131,393	53,091	78,302	131,393

Table 11. Data showing, by States, the number of properties on which sprouting bushes and seedlings were found and destroyed on resurvey in the barberry eradication campaign from April 1, 1918, to June 30, 1925

State	Number of properties on which sprouting bushes were found--				Total number of properties cleared of sprouting bushes:			Number of properties on which seedlings were--			
		In country		Total in cities and country	Dug	Treated	Total	Found	Destroyed		
	In cities and towns	Having escaped bushes	Total						Dug	Treated	Total
Colorado	1,426	96	165	1,591	1,411	179	1,590	85	17	68	85
Illinois	338	290	594	932	406	526	932	248	200	48	248
Indiana	152	108	204	356	248	104	352	31	3	28	31
Iowa	284	210	735	1,019	588	431	1,019	153	93	60	153
Michigan	136	112	286	422	367	55	422	188	184	4	188
Minnesota	693	519	1,097	1,790	1,529	,261	1,790	2,168	2,067	101	2,168
Montana	109	1	46	155	147	8	155	9	8	1	9
Nebraska	191	15	332	523	332	189	521	26	12	14	26
North Dakota	211	0	149	360	223	137	360	1	0	1	1
Ohio	1,045	137	617	1,662	1,567	95	1,662	303	257	46	303
South Dakota	339	33	325	664	510	154	664	65	23	42	65
Wisconsin	870	556	784	1,654	1,277	366	1,643	174	106	67	173
Wyoming	21	0	5	26	18	4	22	6	6	0	6
Total	5,815	2,077	5,339	11,154	8,623	2,509	11,132	3,457	2,976	480	3,456

RESURVEY, SPROUTING BUSHES AND SEEDLINGS, APRIL 1, 1918, TO JUNE 30, 1925

Table 12. Data showing, by States, the number of sprouting bushes and seedlings found and destroyed on resurvey in the barberry eradication campaign from April 1, 1918, to June 30, 1925

State	Number of sprouting bushes found--				Number of sprouting bushes destroyed			Number of seedlings--			
	In cities and towns	In country		Total	Dug	Treated	Total	Found	Destroyed		
		Escaped	Total						Dug	Treated	Total
Colorado	3,780	1,933	3,031	6,811	5,136	1,674	6,810	2,535	707	1,828	2,535
Illinois	4,199	3,943	9,020	13,219	5,604	7,615	13,219	63,452	47,801	15,651	63,452
Indiana	1,482	16,685	18,040	19,522	17,447	1,770	19,217	3,457	255	3,202	3,457
Iowa	3,544	5,992	15,174	18,718	9,856	8,510	18,366	32,433	26,581	5,852	32,433
Michigan	511	1,169	2,391	2,902	2,206	696	2,902	607,261	547,176	60,085	607,261
Minnesota	13,898	14,969	33,703	47,601	40,120	7,481	47,601	25,191	2,494	22,697	25,191
Montana	3,476	3	1,610	5,086	5,024	62	5,086	910	265	645	910
Nebraska	5,972	82	9,552	15,524	12,389	3,132	15,521	2,652	976	1,676	2,652
North Dakota	364	0	840	1,204	196	1,008	1,204	1	0	1	1
Ohio	4,426	6,589	9,075	13,501	10,861	2,640	13,501	252,473	69,603	182,870	252,473
South Dakota	20,978	5,282	22,002	42,980	36,615	6,365	42,980	8,996	6,393	2,603	8,996
Wisconsin	11,111	73,078	76,748	87,859	19,167	68,385	87,552	1,137,737	61,318	1,076,419	1,137,737
Wyoming	356	0	23	379	305	16	321	52	52	0	52
Total	74,097	129,725	201,209	275,306	164,926	109,354	274,280	2,187,150	763,621	1,373,529	2,137,150

Table 13. Data showing, by States, the number of properties on which barberry bushes and sprouting barberry bushes were treated with chemicals, and the number of bushes, sprouting bushes, and seedlings treated from July 1, 1924, to June 30, 1925

State	Number treated--											
	With salt			With sodium arsenite			With kerosene			Total		
	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings
Colorado	70	566	709	0	0	0	1	46	0	71	612	709
Illinois	592	82,009	5,159	6	14	0	5	1,169	0	603	83,192	5,159
Indiana	187	76,732	7,382	0	0	0	0	0	0	187	76,732	7,382
Iowa	355	5,985	2,307	0	0	0	14	161	3	369	6,146	2,310
Michigan	186	4,180	0	0	0	0	131	60,905	97,628	317	65,085	97,628
Minnesota	185	2,709	6,613	0	0	0	0	0	0	185	2,709	6,613
Montana	24	323	0	0	0	0	0	0	0	24	323	0
Nebraska	43	336	0	0	0	0	47	430	554	90	766	554
N. Dakota	78	1,111	1	0	0	0	0	0	0	78	1,111	1
Ohio	327	8,359	40,075	0	0	0	32	160	0	359	9,019	40,075
S. Dakota	124	1,338	481	0	0	0	7	10	16	131	1,348	497
Wisconsin	243	8,425	11,532	0	0	0	0	0	0	243	8,425	11,532
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,414	192,573	74,259	6	14	0	237	62,881	98,201	2,657	255,468	172,460

CHEMICAL TREATMENT, APRIL 1, 1918, TO JUNE 30, 1925

Table 14. Data showing, by States, the number of properties on which barberry bushes and sprouting barberry bushes were treated with chemicals, and the number of bushes, sprouting bushes, and seedlings treated from April 1, 1918, to June 30, 1925

State	Number treated--											
	With salt			With sodium arsenite			With kerosene			Total		
	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings
Colorado	239	2,140	1,828	0	0	0	1	46	0	240	2,186	1,828
Illinois	1,655	112,087	1,529,339	34	839	0	5	1,169	0	1,694	114,095	1,529,339
Indiana	495	99,136	10,487	0	0	0	0	0	0	495	99,136	10,487
Iowa	1,024	27,229	8,340	0	0	0	17	271	3	1,041	27,500	8,343
Michigan	312	10,639	3,000	239	8,594	29,911	131	60,905	97,628	682	80,138	130,539
Minnesota	405	11,604	23,290	25	85	102	2	25	30	432	11,714	23,422
Montana	34	706	1,290	0	0	0	0	0	0	34	706	1,290
Nebraska	359	6,589	7,442	0	0	0	47	430	554	406	7,019	7,996
N. Dakota	201	3,533	7	21	67	0	0	0	0	222	3,600	7
Ohio	405	11,964	111,135	10	1,069	59,300	166	7,864	50,950	581	20,897	221,385
S. Dakota	394	16,868	3,266	0	0	0	7	10	16	401	16,878	3,282
Wisconsin	787	81,779	1,091,404	350	5,824	1,702	[a] 1	[a] 1	0	1,138	87,604	1,093,106
Wyoming	5	13	0	0	0	0	0	0	0	5	18	0
Total	6,315	384,292	2,790,828	679	16,478	91,015	377	70,721	149,181	7,371	471,491	3,031,024

[a] Carbon bisulphide.

Table 15. Data showing, by States, quantities of chemicals used in the barberry eradication campaign from July 1, 1924, to June 30, 1925

State	Salt (Tons)					Sodium arsenite (Gallons)			Kerosene (Gallons)		
	Furnished by--					Furnished by--			Furnished by--		
	Property owner	State agency	Conference: P. G. Rust	U.S.D.A.	Total	Conference: P. G. Rust	U.S.D.A.	Total	Owner	U.S.D.A.	Total
Colorado	0	0	0	0.810	0.810	0	0	0	0	30.00	30.00
Illinois	.650	5.170	0	121.518	127.338	0	27	27	0	124.00	124.00
Indiana	.728	0	0	31.276	32.004	0	0	0	0	0	0
Iowa	6.854	0	.233	17.643	24.730	0	0	0	224.75	0	224.75
Michigan	.030	0	0	19.844	19.874	0	0	0	0	10,811.00	10,811.00
Minnesota	.176	.686	.716	4.122	5.700	0	0	0	0	0	0
Montana	.125	0	0	1.833	1.958	0	0	0	0	0	0
Nebraska	.115	0	0	3.927	4.042	0	0	0	604.00	0	604.00
N. Dakota	3.710	1.500	0	.830	6.040	0	0	0	0	0	0
Ohio	2.139	35.604	0	1.572	39.315	0	0	0	[a] 41.00	108.00	149.00
S. Dakota	5.065	0	0	2.190	7.255	0	0	0	0	15.00	15.00
Wisconsin	.115	33.250	0	2.130	35.495	0	0	0	0	0	0
Wyoming	0	0	0	0	0	0	0	0	0	0	0
Total	19.707	76.210	.949	207.695	304.561	0	27	27	869.75	11,088.00	11,957.75

[a] 20 gallons of this quantity furnished by State.

CHEMICALS, QUANTITIES USED, APRIL 1, 1918, TO JUNE 30, 1925

Table 16. Data showing, by States, quantities of chemicals used in the barberry eradication campaign from April 1, 1918, to June 30, 1925

State	Salt (Tons)					Sodium arsenite (Gallons)			Kerosene (Gallons)		
	Furnished by--					Furnished by--			Furnished by--		
	Property owner	State agency	Conference: P. G. Rust	U.S.D.A.	Total	Conference: P. G. Rust	U.S.D.A.	Total	Owner	U.S.D.A.	Total
Colorado	0	0	0	3.710	3.710	0	0	0	0	30.000	30.000
Illinois	.750	54.170	31.000	231.328	317.248	0	77.000	77.000	0	124.000	124.000
Indiana	.819	0	0	54.716	55.535	0	0	0	0	0	0
Iowa	38.443	0	19.898	43.374	101.715	0	0	0	382.750	0	382.750
Michigan	.030	0	8.491	34.115	42.636	0	0	0	0	10,811.000	10,811.000
Minnesota	.382	.833	9.211	22.160	32.586	0	23.250	23.250	0	[b] 10.000	[b] 10.000
Montana	.125	0	0	3.783	3.908	0	0	0	0	0	0
Nebraska	.128	0	8.550	15.217	23.895	0	0	0	604.000	0	604.000
N. Dakota	9.270	5.000	0	4.330	18.600	0	7.000	7.000	0	0	0
Ohio	2.390	42.133	0	5.178	49.701	16.200	30.100	46.300	2,174.000	[c] 1,089.000	3,263.000
S. Dakota	13.835	0	17.850	2.190	33.925	0	0	0	0	15.000	15.000
Wisconsin	.250	60.150	70.000	25.050	155.450	408.000	190.000	598.000	[a] .375	0	[a] .375
Wyoming	0	0	0	.100	.100	0	0	0	0	0	0
Total	66.472	162.286	165.000	445.251	839.009	424.200	327.350	751.550	3,161.125	12,079.000	15,240.125

[a] Carbon bisulphide.

[b] Drip oil.

[c] 1,939 gallons furnished by State.

GRAND SUMMARY, ORIGINAL BUSHES, SPROUTING BUSHES, AND SEEDLINGS, 1918 to 1925

Table 17. Data showing, by States, the number of bushes, sprouting bushes, and seedlings found and destroyed in all surveys in the barberry eradication campaign, April 1, 1918, to June 30, 1925

State	Original bushes		Sprouting bushes		Seedlings	
	Found	Destroyed	Found	Destroyed	Found	Destroyed
Colorado	24,408	24,396	6,811	6,810	2,535	2,535
Illinois	276,449	276,449	13,219	13,219	1,594,112	1,594,112
Indiana	195,989	195,084	19,522	19,217	11,497	11,497
Iowa	792,123	792,119	18,713	18,366	35,654	35,654
Michigan	468,673	445,432	2,902	2,902	1,390,409	1,390,409
Minnesota	784,499	784,499	47,601	47,601	45,500	45,500
Montana	10,220	10,206	5,086	5,086	1,722	1,722
Nebraska	94,354	94,354	15,524	15,521	9,897	9,897
North Dakota	22,161	22,161	1,204	1,204	157	157
Ohio	263,840	259,652	13,501	13,501	291,264	291,264
South Dakota	59,313	59,313	42,980	42,980	26,254	26,254
Wisconsin	3,373,945	2,864,036	87,859	87,552	1,222,876	1,164,690
Wyoming	4,142	3,968	379	321	52	52
Total	6,370,152	5,831,669	275,306	274,280	4,631,929	4,573,743

Grand total of bushes, sprouting bushes, and seedlings found --------- 11,277,387
Grand total of bushes, sprouting bushes, and seedlings destroyed ----- 10,679,692

SUMMARY OF THE COSTS OF OPERATING 20 GOVERNMENT-OWNED TRUCKS IN THE BARBERRY ERADICATION CAMPAIGN

Table 18. (Dates of purchase approximately July 1, 1923.)
(Dates of disposal approximately May 1, 1925.)

State	Truck Number	Days of Service	Miles Traveled	Actual Depreciation	Cost of Operation and Depreciation	Cost of Repairs	Cost per Mile for Operation [1]	Cost per Mile for Depreciation	Cost per Mile for Operation + Deprec.	Cost per Mile for Repairs	Miles per Gallon of Gasoline	Miles per Quart of Oil
Ill.	819	302	19,422	$247.50	$ 965.68	$ 227.09	$ .037	$ .012	$ .049	$ .011	16.6	71.1
Ill.	820	345	22,274	260.00	932.97	176.34	.030	.011	.041	.008	17.7	69.4
Ill.	843	259	17,445	260.00	898.74	297.00	.036	.014	.051	.017	16.0	83.8
Ill.	844	251	18,507	255.00	831.58	216.42	.031	.013	.044	.011	16.6	105.1
Ind.	821	294	18,585	305.00	1,010.78	125.34	.037	.016	.054	.006	14.9	72.3
Ind.	822	311	16,363	320.00	1,030.86	162.29	.043	.019	.062	.009	15.1	84.7
Ind.	841	298	16,992	288.00	999.36	163.40	.041	.017	.058	.009	16.0	85.8
Ind.	842	269	15,537	305.00	1,016.65	194.86	.045	.019	.065	.012	15.1	80.9
Iowa	824	327	22,650	394.00	1,179.42	199.86	.034	.017	.052	.008	15.1	71.0
Iowa	826	332	20,992	374.00	1,072.63	97.58	.033	.018	.051	.004	13.5	56.7
Mich.	709	433	18,606	233.00	992.38	110.03	.040	.012	.052	.005	13.1	54.5
N. Dak.	703	285	19,690	261.12	1,119.39	99.75	.043	.013	.056	.005	13.4	62.2
N. Dak.	830	241	16,277	261.12	1,121.82	169.42	.052	.016	.068	.010	12.7	60.2
Ohio	816	359	23,019	285.00	1,286.05	292.16	.043	.012	.055	.012	14.5	107.5
Ohio	848	320	22,014	285.00	1,121.32	249.60	.037	.012	.050	.011	15.3	74.1
Ohio	849	280	15,751	285.00	1,035.70	247.55	.047	.018	.065	.015	14.7	82.1
S. Dak.	832	260	24,123	302.56	1,298.78	197.45	.041	.012	.053	.008	14.9	60.7
S. Dak.	840	231	17,572	277.56	903.45	76.05	.035	.015	.051	.004	15.3	84.5
Wis.	708	298	20,199	279.00	926.90	127.42	.032	.013	.045	.006	16.6	112.8
Wis.	836	240	16,985	269.00	739.22	61.56	.027	.015	.043	.004	18.9	155.8
Total--	------	5,935	383,003		20,463.68	3,511.17	-	-	-	-	-	-
Average	------	296.7	19,150	287.34	1,024.18	175.55	.038	.015	.053	.009	15.2	75.8

[1] Includes cost of gasoline, oil, storage, towage, laundry, tires, tubes, and repairs.

ORGANIZATION AND PERSONNEL
July 1, 1925.

Administrative

Washington, D. C. Office of Cereal Investigations, Bureau of Plant Industry, U. S. Department of Agriculture. Associate pathologist in charge, Dr. F. E. Kempton; associate pathologist, Lynn D. Hutton.

Field Operations

Publicity. Cartoonist and illustrator, G. D. George, University Farm, St. Paul, Minn.; associate pathologist, Noel F. Thompson, cooperating with the Conference for the Prevention of Grain Rust, 300 Lewis Building, Minneapolis, Minn.

Investigations. Studies of barberry species and hybrids: Assistant horticulturist, B. Y. Morrison, Bell, Md.; agent, J. H. Craigie, University Farm, St. Paul, Minn.

Epidemiology studies: Collaborating agent, Dr. E. C. Stakman, University Farm, St. Paul, Minn.; assistant pathologist in charge, Edmund B. Lambert, University Farm, St. Paul, Minn., agents, Wallace Butler and Jonas J. Christensen.

Colorado: Department of Botany, Agricultural College, Fort Collins. State leader, Ernest A. Bungren; cooperating agent, Roud McCann, Director of Extension; collaborating pathologists, C. D. Learn and Dr. L. W. Durrell; State law-enforcement agent, Dr. C. P. Gillette, State Entomologist; stenographer-clerk, Miss Winifred Watson; field agents: Jesse A. DeFrance and Bruce J. Thornton.

Illinois: Post Office Building, Urbana. State leader, Gordon C. Curran; cooperating agent, H. W. Mumford, Director of Extension; collaborating pathologist, George H. Dungan; State law-enforcement agent, P. A. Glenn, Chief Inspector, State Department of Agriculture; agent, Miss Mary A. Hopkins; field agents:

Bills, Robert W.
Cornwell, Earl D.
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Ellis, Charles G.
Fielder, Virgil B.
Fobes, Franklin E.
Frolik, Frank
Garrison, Earl R.
Gilbert, Wayne A.
Grumke, Edward C.
Hafenrichter, Atlee L.
Hardy, Max B.
Harmon, R. C.
Hayden, Lyle J.
Holt, Henry C.
Holt, Orval C.
Mathis, Alvin L.
Meyer, Walter M.
Moore, Clarence E.
Muncie, Wendell S.
Powell, Chester R.
Rawlings, Cecil O.
Richardson, John L.
Seward, John H.
Smith, Norman J.
Solheim, Wilhelm G.
Stark, Orton K.
Turner, Lewis M.
Uhlin, Bernard W.
Walters, John C.

Indiana: Botany Department, Purdue University Agricultural Experiment Station, La Fayette. State leader, Wayne E. Leer; cooperating agent, G. I. Christie, Director of Extension; collaborating pathologists, Dr. H. S. Jackson and Dr. E. B. Mains; State law-enforcement agent, Frank N. Wallace, State Entomologist, Indianapolis; stenographer-clerk, Miss Josephine M. Waldron; field agents:

Braybrook, Laurence L.	Fosbrink, Roy L.	Libbert, Clarence B.
Castell, Stanley	Hazel, Edward E.	McCally, Ross L.
Cross, Walter M.	Maggart, Ralph J.	Scearce, Charles G.
Dougherty, Lawrence A.	Miller, Charles H.	Sewell, Gerald S.
Eliason, Everett J.	Palmer, C. Mervin	Zumstein, Reginald B.

Iowa: Botany Department, Iowa Agricultural Experiment Station, Ames. State leader, Marion A. Smith; cooperating agents, R. K. Bliss, Director of Extension, M. H. Burns, Extension Plant Pathologist, N. R. Carmichael, Graceland College, Lamoni, Ia; State law-enforcement agent, Dr. C. J. Drake, State Entomologist; collaborating pathologists, Dr. I. E. Melhus, Station Plant Pathologist, and Dr. S. M. Dietz, assistant pathologist, Office of Cereal Investigations; stenographer-clerk, Miss Frances M. Hanson; field agents:

Border, Nile M.	Inman, Forrest G.	Morris, Le Ross
Dunn, Stuart J.	Leach, Lyle D.	Raleigh, Walter P.
Earhart, Harry C.	Mefferd, Guy A.	Steddom, John M.
Erwin, Lester E.	Mendell, Frank H.	Thompson, James W.
Herriott, Cleon E.	Morling, Edgar S.	Walter, Paul M.
		Zimmerman, Byron B.

Michigan: Agricultural College, East Lansing. State leader, Walter F. Reddy; cooperating agent, R. L. Baldwin, Director of Extension; State law-enforcement agent, L. R. Taft, State Inspector of Nurseries; stenographer-clerk, Miss Bernice L. Waterman; field agents;

Boyd, James L.	Kuhn, George W.	Salisbury, Chester F.
Braamse, Byron L.	Kurtz, Lloyd B.	Schickler, Clyde K.
Braamse, Leonard J.	Lakin, Harold D.	Schwartz, George T.
Cash, Justin C.	Landsburg, Kenneth G.	Smith, Paul M.
Dobben, Ben J.	Lenz, Carl H.	Smith, Roscoe G.
Drew, Kenneth L.	Lewis, James A.	Teeter, Lowell E.
Edmunds, Allen T.	Lioret, Ernest L.	Tillotson, Ivan G.
Francis, Milton J.	McIntyre, Charles W.	Van Buren, Earl C.
Hackett, Paul M.	Markle, Edmund F.	Vaughan, Sylvester M.
Horwood, Russell E.	Mason, Elwood W.	Warner, Robert E.
Hultman, Vivian J.	Moore, Lucius H.	Watson, Elba E.
Humeston, Fred R.	O'Connor, Jack W.	Wenner, Elwyn A.
Jaggers, Francis A.	Ross, Francis W.	Wierman, Leslie B.
Kidman, James L.	Rozell, Andrew M.	Wilt, Clay E.
	Rummel, Martin F.	

Minnesota: University Farm, St. Paul. State leader, Leonard W. Melander; cooperating agent, F. W. Peck, Director of Extension; collaborating pathologists, Dr. E. M. Freeman and Dr. E. C. Stakman; State law-enforcement agent, A. G. Ruggles, State Entomologist; stenographer-clerk, Miss Helen W. Burett; field agents:

Aarke, Einar G.	Gustafson, Carl B.	Peterson, Arthur G.
Allison, Clyde C.	Holloway, James K.	Peterson, Vincent F.
Austvold, Edwin	Kelso, Maurice M.	Powers, Francis B.
Baker, Henry H.	Kunkel, Paul W.	Ryan, John F.
Christgau, Rufus J.	Lefebvre, Camille L.	Schaal, Lawrence A.
Dawley, J. Murdoch	Morris, Harold P.	Schaub, Benjamin H.
Elling, William J.	Oleson, Homer C.	Wallace, James M.
Franze, Fritz G.	Ostrom, Emil H.	

Montana: State College of Agriculture, Bozeman. State leader, W. L. Popham; cooperating agent, J. C. Taylor, Director of Extension; agent, H. E. Morris; State law-enforcement agent, W. L. Shovell, Horticultural Inspector; laboratory assistant, Miss Ruth Swingle; stenographer-clerk, Miss Marguerite Marquis; field agents:

Cummins, George B.	Jennison, Harry M.	Peterson, Millard E.
Donohoe, Heber C.	Kerlee, A. LeRoy	Ross, Richard C.
Forbes, Jacob W.	Lillard, John J.	Sales, Walter L.
Fox, David E.	Long, Fred E.	Swan, Leonard R.
Freeman, Monroe E.	McIver, Kenneth B.	Wisner, Frank B.
	Neill, Frank D.	

Nebraska: College of Agriculture, University Farm, Lincoln. State leader, Albert F. Thiel; collaborating agent, W. H. Brokaw, Director of Extension; collaborating pathologist and law-enforcement agent, Dr. G. L. Peltier; stenographer-clerk, Mrs. Burnetta R. Walroth; field agents:

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Davis, Clyde L.	Harris, Harvey B.	Rohrbaugh, Percy W.
Dittus, Benjamin F.	Hunt, Burt W.	Scrivner, Forrest J.

North Dakota: Agricultural Experiment Station, Agricultural College, P. O. State leader, George C. Mayoue; cooperating agent, G. W. Randlett, Director of Extension; collaborating pathologist, H. L. Bolley; State law-enforcement agent, Joseph A. Kitchen, Commissioner of Agriculture; stenographer-clerk, furnished by the State; field agents:

Anderson, Martin C.	Herbison, Herbert W.	Severson, Albert S.
Archer, Verne R.	Horne, James	Severson, L. N.
Arnold, Cyril H.	Jensen, Clarence L.	Sondreaal, Gilmore E.
Baden, Carl H.	Johnson, Leon M.	Trowbridge, Vernon H.
Baillie, Alden M.	Knight, Allen J.	Trumbull, Francis W.
Bairey, George B.	Miller, Claude L.	Welsh, Maurice J.
Blake, Miss Charlotte E.	Narum, Leslie F.	Yocum, Edward M.
Hendrickson, Earl A.	Rumpeltes, Ben J.	

Ohio: Botany Department, Ohio State University, Columbus, Ohio. State leader, John W. Baringer; cooperating agent, George B. Crane, Director of Extension; collaborating pathologist, W. G. Stover; State law-enforcement agent, Richard Faxon, Chief of the Division of Plant Industry; stenographer-clerk, Mrs. M. E. Joice; field agents:

Atwood, Harry	Isler, David A.	Runnels, Harmon A.
Bangham, Ralph V.	Jackson, Earl K.	Sampson, H. C.
Beck, Byron B.	Jones, Thomas H.	Setterfield, Hugh E.
Buckman, Marcus E.	Kent, Malcolm F.	Shackson, Lee
Christy, Donald F.	Lafferty, Halsey F.	Smith, Warren L.
Cowdrey, G. C.	Leavengood, Joseph D.	Snider, Perry E.
Davis, John A.	Lemasters, Houston M.	Swartz, Delbert
Diller, Jesse D.	Lichti, Ralph H.	Tozzer, Charles W.
Gilmore, R. Clark	Minneman, Paul G.	Violet, Charles O.
Hambleton, Edson J.	Rowalt, Elmer M.	

South Dakota: College of Agriculture, Brookings. State leader, Raymond O. Bulger; cooperating agent, C. Larsen, Director of Extension; collaborators, Dr. A. N. Hume and Dr. A. T. Evans; State law-enforcement agent, H. C. Severin, State Entomologist; stenographer-clerk, Miss Dorothy E. Bossert; field agents:

Caldwell, Ralph M.	Kurtz, William A.	Sayre, Lawrence C.
Eberlein, Louis A.	Larson, Courtney W.	Starr, G. Herman
Errington, Paul L.	Locke, Rush B.	Walter, Glenn L.
Fairchild, Jasper S.	Michaels, Walter H.	Welch, Earl I.
Hume, A. T.	Murray, Joe F.	Welch, Frank F.
Kurtz, Theodore	Rice, Donald T.	

State agents cooperating:

Ekern, Robert L.	Mateer, Harry A.
Malmer, George T.	Murray, Benjamin

Wisconsin: Department of Agriculture, State Capitol Annex, Madison. State leader, William A. Walker; cooperating agents, K. L. Hatch, director of Extension, and R. E. Vaughn, Extension Pathologist; collaborating pathologists, Dr. L. R. Jones and Dr. J. G. Dickson; State law-enforcement agent, Stanley B. Fracker, State Entomologist; stenographer-clerk, Miss Ida T. Goul; field agents:

Bain, Frank C.	McCrea, Forrest D.	Seymour, Walter J.
Cheney, Lellen S.	Nightingale, Gordon T.	Stevens, Harry
Craig, John E.	Otterson, Henry	Stiles, Hugh R.
Damsheuser, C. W.	Owen, Forrest V.	Stinchfield, R. H.
Flueck, Herbert A.	Parmele, Harris B.	Tegge, Charles W.
Harrington, John T.	Pelton, J. LeRoy	Webb, Julian H.
Harrison, Carter M.	Peterson, Lester O.	Whitehead, Lyndell P.
Kline, Homer V.	Rowland, Raymond E.	Zaumeyer, William J.
Knutson, Arthur M.	Schraedl, William S.	

Wyoming: College of Agriculture, University of Wyoming, Laramie. State leader, Ralph U. Cotter; cooperating agent, A. E. Bowman, Director of Extension. State law-enforcement agent, A. D. Faville, President, State Board of Horticulture; stenographer-clerk, furnished by State.

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CEREAL COURIER

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 19

Aug. 10, 1925

Personnel (Aug. 1-10) and Field Station (July 16-31) Issue

PERSONNEL ITEMS

Elmer R. Ausemus was appointed junior agronomist, effective August 1, to conduct, under the supervision of the respective project leaders of this Office, extensive varietal and breeding experiments with spring wheat, spring oats, and spring barley at the Northern Great Plains Field Station, Mandan, N. Dak.

J. Allen Clark, agronomist in charge of western wheat investigations, returned to Washington on August 10 from an extended western trip.

Miss Olive A. Dunn was appointed clerk, effective August 1, to assist in the office of the State leader of barberry eradication in Illinois, with headquarters at Urbana.

Boyd C. Frye, of Peoria, Ill., was appointed assistant clerk-stenographer, effective August 1, to assist J. R. Holbert, in charge of the cooperative cereal disease investigations that are being conducted at Bloomington, Ill. Mr. Frye succeeds Lester J. Sand, who resigned July 31.

Miss Isme A. Hoggan was appointed field assistant, effective August 1, to assist with the cooperative cereal disease investigations that are being conducted at Madison, Wis., under the direction of H. H. McKinney.

Dr. A. G. Johnson, senior pathologist in charge of cereal disease investigations, and B. Y. Morrison, of the Berberis Garden, at Bell, Maryland, inspected barberries in the Dreer Nurseries at Riverton, N. J., on August 3.

Dr. H. H. Love, of the department of plant breeding at Cornell University, who has been in China since last fall, engaged in a cooperative plant improvement program undertaken by the plant breeding department of Cornell University, the Board of International Education, and the University of Nanking, wrote on July 3 of a trip to Yihsien, Shantung Province, Kaifeng, Honan Province, and Nanhsuchow, Anhwei Province, where wheat improvement projects are being conducted. At Yihsien study was made of 1,000 head selections, and at Kaifeng 2,000 head selections were studied. The best of these were selected for trial next year. Further individual selections of wheat heads were made at the three places for seeding this fall.

Doctor Love states that one of the urgent needs is to develop a wheat type resistant to flag smut. The Forward variety developed at Ithaca, N. Y., proved resistant in the experiments at Kaifeng, Honan Province, but it is somewhat late for general culture. It can be used in crossing for resistance to flag smut.

During the summer many wheat selections have been made; there will be nearly 10,000 head rows the coming year. In addition, the varieties sent from this Office will be grown in two or three places. In cooperation with the pathologist these varieties will be inoculated with flag smut.

Both smuts of barley were very prevalent and fields were found with as much as 25 per cent of the disease. A project to develop a resistant variety has been planned. Many selections have been made and these, together with the varieties sent by this Office, will be tried. They will be inoculated with smut to determine their reaction.

F. D. Richey, agronomist in charge of corn investigations, will leave August 15 for points in Ohio, Illinois, Missouri, Wisconsin, Minnesota, North Dakota, Iowa, Kansas, and Nebraska to confer with officials of agricultural experiment stations and members of the Office with regard to the progress of corn investigations. Mr. Richey also will supervise the harvesting of seed and experimental plats at Burdette, Arkansas.

T. R. Stanton, agronomist in charge of oat investigations, arrived at Aberdeen Idaho, on July 31, and found oats on the Substation in splendid condition. It is expected that some of the varieties will yield at the rate of 150 bushels or more to the acre.

On the trip from Ames, Ia., through Minnesota, North Dakota, and Montana, Mr. Stanton noted that crop conditions in general appeared to be only fair, particularly with regard to the small grains; corn probably is in better condition than usual. In Minnesota and eastern North Dakota considerable rust infection was prevalent in spring wheat. Undoubtedly the yields will be markedly reduced in many districts.

In western North Dakota and in Montana crop conditions were very generally reported as spotted, as many sections had been favored by local showers. However, the unusually hot weather of the first half of July had injured more or less all small grains throughout these States. In Idaho, however, crops appear to be exceptionally promising. Because of more rain than usual excellent yields of wheat will be obtained this year on the bench lands of southern Idaho.

While at the University Farm, St. Paul, Minn., and at Fargo and Mandan, N. Dak., Mr. Stanton was accompanied by Prof. L. H. Newman, Dominion Cerealist, of Ottawa, Canada, who had made a brief excursion into the United States to observe and study cereal experiments. Professor Newman was particularly interested in the behavior of new varieties of spring wheat.

Gilbert K. Terpening was appointed unskilled laborer, effective August 1, in the cereal disease experiments conducted at the Woodward Field Station, Woodward, Okla.

VISITORS

Dr. Theodor Roemer, professor of plant breeding of Halle University, a member of the party of German scientists who visited the U. S. Department of Agriculture in April, returned to Washington recently from an extended trip in the agricultural districts of the western United States. Doctor Roemer was an office visitor on August 10. He will spend some time in Washington before sailing for Europe on September 3.

MANUSCRIPTS AND PUBLICATIONS

55 A manuscript, entitled "Cytological Studies of Puccinia graminis tritici Forms 9, 21, and 27 on Khapli Emmer," by Ruth F. Allen, was submitted August 7 for publication in the Journal of Agricultural Research.

Galley proof of article, entitled "Associations Between Number of Kernel Rows, Productiveness, and Deleterious Characters in Corn," by Curtis H. Kyle and Hugo F. Stoneberg, for publication in the Journal of Agricultural Research, was read August 10.

The article entitled "Acidity and Varietal Resistance of Wheat to Tilletia tritici," by Annie May Hurd-Karrer, appears in the American Journal of Botany, vol. 12, no. 7, p. 359-371. July, 1925.

Department Bulletin 1341, entitled "Effects of Continuous Selection for Ear Type in Corn," by H. S. Garrison and Frederick D. Richey, dated August, 1925, was received August 7.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (No report)

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig) (N report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (No report)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (July 23)

Hand pollinating in the corn breeding plats was begun last week. The outloo for a normal season is very poor, however.

According to the Weather Bureau this is the driest season in 55 years. The drought and extreme heat have extended over a longer period than ever before recorded. The precipitation since the first of the calendar year is 15 inches belo normal. There was a rain of 0.80 inch on July 16, the first since May 8. Much o the corn already had burned up; many rows are again beginning to show lack of moisture. As much pollinating as possible is being done, but the indications are that many of the selfed lines for this year will be lost.

Farmers of this section and in many other parts of the State probably will lose thousands of dollars. Truck crops, grasses, and pastures, corn, tobacco, and potatoes are partial or total failures. Even many forest trees are dying for lack of moisture. The pasture shortage will hit the dairy industry hard.

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (No report)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, (J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (No report

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (July 31)

The crew of barberry eradicators, composed of seven Federal agents and two inspectors of the State department of agriculture in April, May, and June, was strengthened by the addition of new members in late June and early July. Our force now numbers 29 Federal and two State men. Four agents are resurveying constantly in the 68 counties that had been covered previously by the original survey. Four agents are conducting original survey in Columbiana County, four in Mahoning County, eight in Trumbull County, eight in Geauga County, and two in Lake County. The original survey is being done by the intensive "every wood-lot scouting method" which was given a trial in Portage County this spring.

On July 1 a fairly large area of escaped barberries near Chardon, Geauga County, was treated with salt. On July 2 the entire force was on hand at a "barberry-cue treat" four miles east of Chagrin Falls. On this occasion kerosene was used. Escaped barberry bushes were so large and so thick at this location that 1,244 gallons were used on about 15 acres on one farm. Motor tank trucks delivered the kerosene right into the barberry patch wherever it was needed. On July 3 five tons of salt were applied to escaped barberries one and one-half miles east of Rootstown, Portage County. During these first three days in July the new, inexperienced men were given a first-hand introduction to some of the problems of barberry eradication by means of lectures, conferences, and intimate contact with barberries in fields, wood lots, and fence rows.

Every means is being used to bring the barberry eradication program to the attention of the public in counties where the original survey is in progress. Every farmer in each county receives a circular letter a few days before the barberry hunters arrive. All newspapers in the counties where operations are in progress are contributing freely with good barberry eradication news. Barberry eradication displays are in prominent windows in the townships where men are working. Colored plates Nos. 1 and 2 are being used extensively as posters on store walls, in windows, and on billboards. Picture shows are running the "Battle Against Black Stem Rust" and are glad to get it.

Undoubtedly our most valuable puplicity is being obtained at farmers' meetin held in cooperation with the County farm bureaus or with local grange organizatio At these meetings barberry motion picture showing is accompanied by a lecture, which is made possible by the use of our portable De Vry projector. Valuable lea are often obtained at such meetings. In some instances as many as 250 farmers ar in attendance at a single meeting.

A new publicity stunt which gives promise of much success is the use of larg roadside sign boards. These signs are made of galvanized iron on wooden frames 3 feet by 5 feet, and are painted in white letters on a blue background. Each sign bears these words: "This is a European Barberry Bush. It spreads rust to wheat. For further information inquire of any County Farm Bureau Agent." The signs are being placed near large barberry bushes growing in yards, wood lots, or fields ne prominent public highways.

From July 8 to 14, inclusive, the writer was privileged to attend a meeting of cereal pathologists at Ames, Iowa; St. Paul, Minn., and Fargo, N. Dak.

On July 27 Noel F. Thompson, of Madison, Wis., came to Ohio for a conference with the barberry eradication publicity man and the writer concerning plans for more extensive and better publicity for the campaign during the remainder of the season.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (August 3)

The original survey began in Michigan June 27 with 42 men, six, including the squad leader, being assigned to a county. One squad was assigned to Wexford County in which there remained one township not covered in 1924. Other men went into Benzie, Grand Traverse, Kalkaska, Crawford, Oscoda, and Alcona counties. The work has been completed in Wexford, Oscoda, and Alcona counties.

The intensive survey conducted this season certainly insures a thorough job. Foot scouting has located bushes in the most unexpected places. Extensive areas of escaped bushes have been found in Manistee, Benzie, and Grand Traverse counties

Swamps, hills, and undergrowth composed mostly of blackberry bushes, have made progress more difficult. Poisonous snakes have presented an additional problem. One scout in Kalkaska County was struck on the puttee by a rattler. He brought in as evidence six rattles and a button. Blow snakes have put two men under the weather for a few days.

Marilla township is the northern and western part of Manistee County. An extensive barberry planting made in 1855 was found in a remote section. After the field men had conducted an extensive survey over six sections they hoped that they had reached the outer edges of the spread. The same number of bushes was found in the next six sections. The intensive survey has continued over a township and the outer limits have not yet been reached. The bushes are difficult to find in the dense undergrowth, but the problem of getting chemicals to them will be greater.

More escaped bushes will be found in Benzie County than in any other county surveyed so far. The following details of one area will show how bushes spread over a long period of time and what may be expected unless the spread is checked. A saw mill was in operation in Blaine township 44 years ago, but nothing now remains to indicate its existence. There are no houses reasonably close; not even the lilac is present to indicate that at one time a settlement existed about the old mill. Sturdy, heavy fruit-producing barberry bushes are numerous, however. The spread of bushes from this planting has been traced for three miles in one direction, and there is every reason to believe that it will be as great in other directions.

Barberry bushes in this section of the State are very heavily infected at this time. This secondary infection is greater than that of May and June. Many farming sections are secluded or cut off by second growth of timber and extensive swamps.

Different varieties of stem rust are apparent in the same vicinity. In one area only oats are heavily infected, while a short distance away only rye and its associated grasses are rusted.

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (July 30)

It was decided this year to concentrate on the second survey in southwestern Minnesota. Accordingly, teams were assigned to Lincoln, Lyon, Pipestone, Murray, Rock, Nobles, and Cottonwood counties. These were the first counties completed in the original farm-to-farm survey in 1919 and 1920. Additional teams were assigned to survey Wright County and the remainder of Meeker County. A close survey is the only efficient remedy; every place where any kind of a shrub is growing must be thoroughly surveyed. In Rock County (completed in the original survey in 1919) escaped bushes were found on six properties in one township. Five had only one bush each, which might have been very easily overlooked in the groves. The same situation exists in Meeker County. A large bushe eight feet high and four feet in diameter at the base was found four miles from the closest known barberry planting. The situation in Rock County is very interesting because this county is in the extreme southwestern corner bordering on South Dakota and northwestern Iowa.

Several instances of barberry spreading stem rust to adjacent grains and grasses have been noted. In Meeker County three distinct cases were found. The first was a large escaped bush spreading rust to Agrostis alba. The second was another escaped bush in a large meadow covered with Hordeum jubatum almost killed with stem rust. Wheat in fields half a mile distant was also heavily rusted. The third case was that of a bush located next to a wheat field; the wheat next to this bush was more heavily infected than that on the opposite side of the field. The farmer gave the scouts a written statement to the effect that in the past 30 years stem rust had damaged his grain every year, even in years unfavorable for stem rust.

In Redwood County the spread of stem rust was traced two miles on Hordeum jubatum. This was the wheat strain of stem rust, because Agropyron repens was not rusted; and greenhouse inoculations of wheat, barley, rye, and oats showed that only the wheat and barley became infected. Several other interesting rust spreads were found in Yellow Medicine, Murray, and Nobles counties.

Viable aeciospores are still being found on the bushes. What apparently happened in Minnesota this year was that the dry spring resulted in a very light, early infection of the barberries. When the rains came early in June a heavy new infection took place which in many cases literally plastered the bushes with rust. In all probability, the large quantity of inoculum from these late infected bushes had considerable effect on the tremendous increase of rust in the field early in July. One peculiar thing about the general infection in the State this year is that it appears streaked from north to south. There is a heavy infection in the southwestern and west-central portions and another streak up through the center of the State in the St. Cloud district.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (August 1)

The weather was very dry soon after the middle of July, but rains from the 19th to the 29th were of much benefit and the prospects are favorable for good yields of sorghums and broomcorn.

The seedings in the earlier date-of-seeding experiments were damaged by the hot dry period of June and July.

On July 15 short-season sorghums were seeded in a date-of-seeding experiment. The varieties used were Feterita, C. I. No. 182; Dwarf feterita; Early White Milo, C. I. No. 480; Pink Kafir, C. I. No. 432; a Freed sorgox Kafir hybrid; Freed sorgo, C. I. No. 350; Red amber; and Sudan Grass. These emerged to fair stands by the 20th.

In the varietal experiments the earlier varieties are beginning to head. Heads also are appearing in the nursery and on a number of the hybrids. English sparrows are damaging feterita and Dwarf Milo in the earlier date-of-seeding experiments.

L. W. Osborn, Extension Agronomist of Oklahoma, visited the Station and inspected the project July 31.

Maximum temperature for the last half of July was 111° on the 18th; minimum, 54° on the 31st; precipitation, 2.30 inches, which was recorded on seven days between July 19 and 29.

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (No report)

Hays Branch Experiment Station, Hays (A. F. Swanson) (July 31)

The Hays section has been highly favored with rain this month, the total precipitation being 6.73 inches, the fourth highest rainfall for any month of July since 1868. This amount is almost equal to half of the entire precipitation of last year in this vicinity. Within 50 miles of Hays there are sections, however, which are very much in need of rain, not only for row crops but in the preparation of land for wheat.

The sorghums growing on the commercial fields, as well as those on the experimental plats, have never been more promising. Sorghums are just now beginning to head. A number of sorghum heads have already been bagged on the cereal project.

The following yields of oats were obtained at this station in the varietal test.

Variety	C. I. No.	Series 1	Series 2	Average
Burt (Akron 916)	2054	11.7	15.6	13.7
Kanota (Check)	839	7.0	11.7	9.4
Kanota	839	5.5	12.5	9.0
Burt	293	7.8	10.2	9.0
Kanota (Check)	839	7.8	9.4	8.6
Burt X Sixty-Day	727	7.0	10.2	8.6
Fulghum	708	4.7	11.7	8.2
Albion	729	3.1	12.5	7.8
Sixty-Day	165	3.9	8.6	6.3
Richland	787	1.6	9.4	5.5
Kherson	459	1.6	8.6	5.1
Gopher	2027	1.6	3.9	2.8
Ferguson No. 71	---	3.1	2.3	2.7
Red Rustproof (Texas No. 1118-2)	---	1.6	.8	1.2

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (August 1)

The weather for the first half of July was very hot and dry, temperatures over 100 degrees being recorded on five days, with a maximum temperature of 107. Precipitation for the month was 2.40 inches, leaving a deficit of 0.28 inch.

Threshing in the nursery was completed July 30. Corn pollination is practically completed.

All series in the small grain and nursery experiments have been disked to control thistles. The soil is dry to a depth of five to six feet and corn and sorghums are badly burned.

Average yields of spring wheat varieties grown in replicated plat experiments at the North Platte Substation, North Platte, Nebr., in 1925

Class and Variety	C. I. No.	Yield per acre, (bushels)
Durum		
Nodak	6519	16.0
Kubanka	1440	15.3
Akrona	6881	14.6
Hard Red Spring		
Marquis	3641	15.8
Ceres (Kota x Marquis)	6900	15.3
Ruby	6047	15.1
Kanred x Marquis (1718B8-11)	7370	14.6
Kota	5878	13.0
Progress	6902	13.0
Marquis x Iumillo (II-15-44)	6887	11.5
White		
Quality	6607	14.4
Hard Federation	4733	13.8

Average yields of winter wheat varieties grown in replicated plat experiments at the North Platte Substation, North Platte, Nebr., in 1925

Variety	C. I. No.	Yield per acre, (bushels)
Nebraska No. 60	6250	24.8
Newturk (awnless)	6935	24.5
Kharkof	1442	23.8
Kanred	5146	23.6
Nebraska No. 30	7358	23.6
Minturki	6155	23.6
Karmont	6700	23.5
Nebraska No. 6	6249	23.3
Turkey (Sel.)	7363	23.2
Beloglina	1543	23.0
Blackhull	6251	22.6
Montana No. 36	5549	22.3
Hussar	4843	22.0
Marquis x Kanred (Kans. No. 441)	---	22.0
Turkey (Local)	----	21.8
Turkey (Sel.)	7364	21.6
Marquis x Kanred (Kans. No. 449)	---	21.4
"Kanmarq"	6937	21.0
"Tenmarq"	6936	20.7
Sherman	4430	20.2
Nebraska No. 28 (awnless) (Sel.) (Kans. No. 2526)		17.8
Nebraska No. 28	5147	16.6

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) (August 8)

Results of the survey completed so far this year indicate that the second survey is being justified. Twenty-eight plantings of 212 bushes that were not found on previous surveys have been located since June 1. Twenty-two of these plantings were found on second survey and the other six as the result of investigating reports received at fairs and other demonstrations. Second survey has been conducted in areas which have shown the heaviest stem-rust infection in recent years. All of the bushes found have been infected.

Stem rust developed rapidly during July, and caused some loss to susceptible wheat varieties. Excessively hot and dry weather just prior to harvest caused many crops to ripen prematurely. As a result, heads were poorly filled and kernels were shriveled. Many reporters estimate a greater loss from heat than from stem rust. With the two factors affecting crops at the same time, it is difficult to give each a proper weight. There probably will be an average loss of 15 per cent in bread wheats in the areas of heaviest infection of stem rust. Individual fields may show a greater loss.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (August 5)

On July 1, 22 men were placed in squads in Dickey, Logan, Emmons, and McIntosh counties on second survey. Heavily infected bushes and sprouts have been located in each of these counties. Bushes were traced from local infections in the grain in Dickey and Logan counties.

Demonstrations have been made at the State fair at Fargo; Northwest fair, Minot; Interstate fair, Grand Forks, and at eight county fairs. Much more interest was shown in these demonstrations than in previous years. Each demonstration was attractively made up and in charge of an assistant who had had much field and demonstration experience. In addition, there were window displays and demonstrations in the field where bushes were located. The latter attracted a great deal of local attention and proved very satisfactory.

The first infection on grain was found June 15 on Preston wheat in the College plats. Immediately afterwards Fargo was surveyed and rusted bushes and sprouts were located. The first infected barberries were located in Morton County on June 2. Rusted barberries appeared to have been first infected about the middle of May. Excellent weather for the development of rust began with the first of June and has continued most of the time since, especially in the eastern half of the State.

The heaviest infection is in the southeastern portion of North Dakota with less rust in the northeast quarter. The rust ranges from moderate to heavy infection in most of the hard-spring wheat fields. The western half of the State has a trace of infection, except for a few fields which are moderately infected. The infection this season varies very much from field to field and within the fields,-much more so than in any previous year.

The greatest damage to small grains has resulted from premature ripening caused by very hot weather and drought. Losses from rust will undoubtedly range from 5 to 35 per cent in the eastern half of the State and from 0 to 5 per cent in the western portion.

Dickinson Substation, Dickinson (R. W. Smith) (July 31)

The weather of the latter half of July has been comparatively cool in contrast with the extremely hot weather that prevailed from July 10 to July 15. The month has been quite dry with a total precipitation of 1.25 inches. The principal rain of the month was recorded on July 26 with a precipitation of 0.60 inch. On the latter date a hailstorm passed near Dickinson causing considerable injury to cereal crops in Stark County. The crops on the Substation have not been seriously injured by hail since 1914.

Winter rye and early barley in this vicinity have been harvested, and the harvesting of early-sown spring wheat is just beginning. On the Substation most of the varietal plats of rye, winter wheat, barley, and oats have been harvested, and the early varieties of spring wheat were harvested today. In the cereal nursery most of the varieties of oats and barley have been harvested.

Although the present cool weather favors the normal filling of the cereal grains, the yields on the Substation and in this vicinity will be light because of the dry weather and extreme heat early in the month. On all cereal crops the height of plant will be somewhat below normal for this locality. There is only a trace of stem rust on the wheat varieties.

Selfing is being done in the corn nursery consisting of 440 ear rows. Most of these strains had been selfed one or two years previously. It is fortunate that the weather is cool, permitting the slow maturity of corn and other grain, otherwise time would not permit the necessary taking of notes, harvesting, and selfing at the proper time.

Among the official visitors at the Substation in the past two weeks were the following: L. R. Waldron, T. E. Stoa, W. E. Brentzel, and C. S. Reddy for the study of flax diseases; N. W. Talbot, in charge of weed investigations, Office of Econom and Systematic Botany; Robert Wilson and J. T. Sarvis, of the Northern Great Plains Field Station; J. Allen Clark, T. R. Stanton, and J. H. Martin, of the Office of Cereal Investigations; and M. B. Johnson, of the Bureau of Agricultural Economics.

A large crowd attended the annual picnic at the Substation on July 18. An interesting program included music by the Dickinson Band, speeches by J. H. Sinclair M. C., Robert Wilson, of Mandan, and Charles Eastgate, agricultural agent. The program was followed by a baseball game between two local teams.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (August 1)

The weather of the last half of July has been very dry. The total precipitation recorded for this period was only 0.1 inch.

The maximum temperature was 92° on July 18; minimum 43°, July 31.

Harvesting of the barley varietal plats was completed July 27. Harvesting of the wheat and oat varietal plats was completed to-day (Aug. 1). Yields of the cereal varieties doubtless will be above average, but owing to the hot, dry weather will not be so good as anticipated.

Harvesting of the wheat nursery was begun July 28, and a large portion of the nursery already has been harvested.

A. C. Dillman, associate agronomist in charge of flax investigations, returned to the Station July 17; J. Allen Clark, agronomist in charge of western wheat investigations, this morning. The following visitors looked over the cereal experimental plats in the last half of July: T. R. Stanton, L. H. Newman, Dominion Cerealist from Ottawa, Canada, C. S. Reddy, and W. E. Brentzel, July 22; R. W. Smith, July 23, and J. H. Martin, July 25.

E. R. Ausemus arrived July 28 and on the following day reported for duty as Junior Agronomist in charge of wheat breeding.

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (No report)

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (August 1)

Barley in plats and nursery rows has been harvested. Wheat and oats in the plats are being harvested at the present time.

The annual field day was held July 14 with a fair-sized crowd in attendance. Much interest was shown in the various field experiments. In the afternoon addresses were given by Dean E. J. Iddings, of the University of Idaho, C. B. Ahlson, State Seed Commissioner, and A. E. McClymonds, superintendent of the Aberdeen Substation.

Among recent visitors at the Substation were M. A. McCall and O. Kukula, July 11-13; Dean E. J. Iddings, C. B. Ahlson, State Seed Commissioner, Ralph Bristol, Assistant State Seed Commissioner, and W. A. Moss, superintendent of the Felt Substation, on July 14.

M. N. Pope, assistant in barley investigations, was at the Substation from June 23 to July 27, studying and harvesting the barley nursery; F. A. Coffman, associate agronomist in oat investigations, has been at the Substation since July 1 studying and harvesting oat varieties in the nursery.

The weather in July was comparatively favorable for all crop growth. An abundance of irrigation water was available, and all crops were irrigated as needed. The four hottest days on record were July 13, 14, 15, and 16. A temperature of 102 degrees was recorded on the 14th.

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (No report)

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell) (July 31)

Threshing of the varietal experiments was completed on July 27. The grain yields and the characteristics are on the same order as those reported for the cereal nurseries in the Courier of July 20.

The yield of individual plats and the average yield in bushes per acre of wheat, barley, and oats grown in 50th-acre plats replicated four times are shown in the following tables:

Yields in bushels of 27 varieties of wheat grown in 50th-acre plats replicated four times at University Farm, Davis, Calif., in 1925.

Variety	C.I. No.	Ser. 1	Ser. 2	Ser. 3	Ser. 4	Ave. (Bu. per A.)
Federation	4734	71.7	44.2	45.0	66.7	56.9
Bunyip	5125	59.2	45.0	59.2	50.8	53.6
Hard Federation X Klein Koren (1986 A4-3-1)	----	34.2	60.0	48.3	58.3	50.2
Sonora X Cedar (Calif. No. 873)	----	35.0	52.5	50.8	60.8	49.8
White Federation	4981	43.3	49.2	50.0	45.8	47.1
Hard Federation X Klein Koren (1986 A1-1-3)	----	39.2	55.0	31.7	59.2	46.3
Hard Federation	4733	47.5	47.5	46.7	41.7	45.9
Defiance X Baart (Calif. No. 109)	----	36.7	54.2	41.7	49.2	45.5
Baart	1697	42.5	45.8	46.7	46.7	45.4
Baart X Hard Federation (1969 A1-16-10)	----	32.5	50.8	41.7	50.0	43.8
Hard Federation X Klein Koren (1969 A4-3-2)	----	31.7	50.0	40.0	45.8	41.9
Onas	6221	39.2	47.5	30.8	45.0	40.6
Sonora X Cedar (Calif. No. 903)	----	26.7	43.3	45.8	46.7	40.6
Defiance X Baart (Calif. No. 116)	----	33.3	35.8	45.0	46.7	40.2
Kharkof	1442	33.3	35.8	41.7	45.8	39.2
Baart X Hard Federation (1969 C1-16-5)	----	30.8	40.0	39.2	43.3	38.3
Oudebaard (Sel.)	6228-1	30.8	43.3	30.0	--	34.7
Sonora	3036	35.8	36.7	36.7	29.2	34.6
Marquis	4158	30.0	35.0	40.8	29.2	33.8
Hindi	----	26.7	41.7	30.8	32.5	32.9
Jenkin	5177	20.8	28.3	36.7	43.3	32.3
Pacific Bluestem	4067	30.8	37.5	33.3	26.7	32.1
Pilcraw	5540	24.2	29.2	37.5	37.5	32.1
Little Club	4066	24.2	30.8	31.7	38.3	31.3
Oudebaard	6228	32.5	35.0	24.2	33.3	31.3
White Australian (Sel. 40W)	----	27.5	26.7	37.5	50.0	30.4
Defiance X Baart (Calif. No. 142)	----	25.8	25.0	20.0	34.2	26.3

Yields in bushels of 11 varieties of barley grown in 50th-acre plats replicated four times at University Farm, Davis, Calif., in 1925.

Variety	C. I. No.	Ser. 1	Ser. 2	Ser. 3	Ser. 4	Ave. Bu. per
Hero	1286-1	47.9	74.0	79.2	81.3	70.6
Coast	690	52.1	75.0	66.7	87.5	70.3
Cape-Coast (Calif. 1518)	---	64.6	66.7	74.0	67.7	68.3
Tennessee Winter (Calif. No. 2272)	---	47.9	74.0	74.0	75.0	67.7
Cape-Coast (Calif. No. 1511)	---	58.4	66.7	62.5	77.1	66.2
Tennessee Winter	257	50.0	61.5	65.6	74.0	62.8
Club Mariout	261	35.4	62.5	67.7	49.0	53.7
Coast (Sel. 276B)	---	29.2	53.1	53.1	61.5	49.2
Trabut	---	35.4	38.5	60.4	54.2	47.1
White Smyrna	---	37.5	39.6	45.8	64.6	46.9
Coast (Sel. 170B)	---	25.0	50.0	38.5	50.0	40.9

Yield in bushels of 6 varieties of oats grown in 50th-acre plats replicated four times at University Farm, Davis, Calif., in 1925.

Variety	C. I. No.	Ser. 1	Ser. 2	Ser. 3	Ser. 4	Ave. Bu. per
Sunrise (Calif. No. 1012)	1799	90.6	71.8	79.7	48.5	72.7
Glenn Innes	980	64.1	67.2	82.8	59.4	68.4
Fulghum	708	73.4	75.0	53.1	68.7	67.6
Ligowa X White Tartar	---	60.9	56.3	89.0	46.9	63.3
California Red (Calif. 1003)	1026	57.8	54.7	71.8	35.9	55.1
Guyra (Calif. 1019)	2034	43.8	45.3	46.9	48.5	46.1

Dr. C. R. Ball, senior agronomist in charge, arrived at Davis July 27.

Agricultural Experiment Station, Berkeley (F. N. Briggs) (No report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 20

August 20, 1925
Personnel (Aug. 11-20) and Field Station (Aug. 1-15) Issue

PERSONNEL ITEMS

J. W. Jones, associate agronomist at the Biggs Rice Field Station, Biggs, Calif., has been authorized to travel in Japan, Chosen, China, the Philippine Islands, Java, and other parts of the Orient in search of early-maturing varieties of rice for growing in California. Mr. Jones will sail September 1 from San Francisco on the Taiyo Maru. He will be absent from this country about six months.

Otakar Kukula, who has made his temporary headquarters in the Office of Cereal Investigations since April 30, has been called to his home in Czechoslovakia by the death of his father.

John H. Parker, professor in Farm Crops of the Kansas State Agricultural College and agent of the Office of Cereal Investigations, stopped at Washington on Monday, August 17, on his way to Cambridge, England, where he will spend a year in graduate study. He will also visit other institutions in England and on the Continent in connection with his work.

Professor Parker has tendered his resignation effective September 15. He has leave of absence from Kansas until July 1, 1926. He has been authorized to attend the meetings of the British Association for the Advancement of Science on August 26 to September 2, as a representative of the United States Department of Agriculture. At the meetings he will present a paper on certain phases of the cereal work at the Kansas Station.

Professor Parker will be accompanied by his family in England.

M. N. Pope, associate agronomist in barley investigations, returned August 15 from an extended field trip.

J. W. Taylor, associate agronomist at Arlington Experiment Farm, Rosslyn, Va., was authorized on August 12 to go to Ithaca to confer with cooperators in connection with cooperative cereal investigations at Ithaca and in other parts of New York.

VISITORS

Dr. Theodor E. M. Roemer, professor of agriculture in Halle Saale, Germany, was an Office visitor the early part of this week. While here he made arrangements for obtaining samples of winter hardy wheats for growing in Germany. He had just returned from an extended trip across the country during the course of which he visited many of the important experiment stations.

MANUSCRIPTS AND PUBLICATIONS

56 A manuscript, entitled "The Inheritance of Resistance to Bunt, Tilletia tritici (Bjerk.) Winter, in Wheat," by Fred N. Briggs, was submitted August 12 for publication in the Journal of Agricultural Research.

57 A manuscript, entitled "Inheritance of Resistance to Leaf Rust, Puccinia triticina Eriks. in Crosses of Common Wheat, T. vulgare Vill.," by E. B. Mains, C. E. Leighty and C. O. Johnston, was submitted August 17 for publication in the Journal of Agricultural Research.

An article, entitled "Inheritance in Wheat of Resistance to Black Stem Rust," by H. K. Hayes, E. C. Stakman, and O. S. Aamodt, appears in Phytopathology, vol. 15, no. 7, p. 371-387. July, 1925. (Cooperative investigations between the Office of Cereal Investigations and the Minnesota Agricultural Experiment Station.)

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs) (No report)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) [August 3]

All threshing has been completed and the grain weights of the rod row selections are being taken. Seed samples for the 1926 crop are being prepared for treating with one of the mercury compounds.

The yields of the winter oat varieties for 1925 are as follows:

Grain yield in bushels per acre of varieties and selections of winter oats grown in duplicate 1/40th acre plats. 1925.

Variety	C. I. No.	Grain, bu. per acre	Average grain yield of 6 nearest check plats	Gain or loss from check Average
Lee	2042	77.8	62.9	14.9
Bicknell	206-155	65.9	54.0	11.9
Sel. 1001T-1-1B		65.2	59.3	6.9
Hatchett	838	70.9	65.0	5.9
Custis	2041	67.0	62.9	4.1
Sel. 1001D1-2B		68.4	65.0	3.4
Sel. 1001H1-4B		67.3	65.0	2.3
Culberson	273-I-14	57.5	59.3	-1.8
Winter Turf	541-4	58.7	62.9	-4.2
do	435-4	57.3	62.9	-5.6
do	431	52.0	59.3	-7.3
Dwarf Culberson	748	44.2	54.0	-9.8
Red Rustproof	1815	43.0	59.3	-16.3

Lee, locally known as Hyattsville's Best, is a hybrid selection which has shown exceptional yielding ability in the four years tested at Arlington. In the cross of Winter Turf x Aurora, Mr. T. R. Stanton, agronomist in charge of oat investigations, has an unusual example of the improvement possible from hybridizing and selection. In addition to Lee, there have been isolated from the cross five strains which have shown yielding ability superior to either parent. The Lee and Custis strains carry the high bushel weight and plumpness of the Aurora parent, which is no small gain.

The highest single plat yield of oats was 91.0 bushels per acre made by Fulghum 699-2011. This is a selection of Fulghum, C. I. No. 708, with a winter habit of growth. It is distinct from Fulghum and no doubt superior for this section as a fall-sown oat. The Winter Turf selections, usually the leaders, were evidently handicapped by the season as the yield was poor. The oat varieties matured eight to 10 inches shorter in straw than usual and ripened rapidly, which probably favored the earlier strains.

Grain yield of varieties or selections grown in single 1/40th acre plats. 1925.

Variety	C. I. No.	Grain Bu. per acre	Average yield: 2 check plats:	Gain or loss from check
Fulghum 699-2011		91.0	43.0	48.0
Winter Turf x Aurora		77.8	43.0	34.8
Fulghum 650-203		71.9	43.0	28.9
Fulghum x Hatchett		67.5	43.0	24.5
Hutcheson	947	78.9	55.8	23.1
Fulghum x Hatchett a3		65.4	43.0	22.4
Fulghum	708	66.0	55.8	10.2
Black	691	48.8	43.0	5.8
Ferguson No. 11	844	57.9	55.8	2.1
Dwarf Culberson x Fulghum		40.0	43.0	- 3.0
Hardy Rustproof		31.8	43.0	-11.2
Ferguson Navarro	966	39.5	55.8	-16.3
Red Rustproof	1079	18.1	43.0	-24.9

The later maturing ryes yielded considerably higher than the earlier ones, but the quality of the grain was poorer. Star, a variety in test for its second consecutive year, appears to be of value. It is even later than Rosen and grows slowly in the fall.

The rye yields for 1925 are as follows:

Variety	C. I. No.	Grain, bu. per acre
Von Rumker	173	42.9
Rimpau	126	38.4
Von Rumker	133	38.3
Star		37.7
Mexican	108	35.4
Rosen	195	35.2
Henry	128	35.1
Ivanof	34	30.4
St. Johns	130	30.3
Winter	208	30.2
Virginia	128-1	27.4
Abruzzes	40	27.1
Giant Winter	30	21.5

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig)

(No report)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins) (August 13)

The total precipitation for July was 1.86 inches, which is .44 inch more than it was during July of last year, and 4.66 inches less than the average for the past 15 years during the same period. The total precipitation to date is 21.81 inches which is 9.82 inches less than the average for the same period for the past 15 years.

On account of excessively low rainfall during July the streams in southwestern Louisiana have become entirely too salty for the irrigation of rice, and as a result there is little, if any, late rice which has been irrigated from these streams that will produce sufficient grain to pay for the harvesting. Many farmers, however, continue to use water with a high salt content. Tests made at the end of the month indicate that the salt content in the fields varied from 372 to 460 grains per gallon. In passing a field containing this salt water the odor common along salt water streams is easily detected. This is especially true where the fields have been allowed to become dry. Rain at this time would help very little in reducing the damage to the late rice which has been irrigated from streams. The greater part of the crop is now beginning to head.

Samples of water from the Mermentaw River taken the latter part of the month indicated a salt content as high as 670 grains per gallon.

The deep wells are still holding out, and many are doing double duty in an effort on the part of the owners to render assistance to their neighbors.

The station work went forward normally during July. The roguing of plats and the cleaning of levees were much further advanced at the end of the month than at the same time any previous year. This is due mainly to systematic weed control during previous years, both by rotation with soybeans and roguing. Climatic conditions have also been favorable.

The rice plats are in good condition. The soybean plats have made a good growth but would be greatly benefited by rain.

During the past few weeks, Mr. J. W. Ingram, Jr., Entomologist, Bureau of Entomology, U. S. Dept. of Agriculture, with headquarters at this Station, has demonstrated beyond doubt the effectiveness of sodium fluosilicate for the control of the blister beetle. In every instance where used this material has killed all the insects. In order that a good field test might be made, two negro farm laborers were put to work in a three-acre field of Biloxi soybeans that was badly infested with blister beetles. As soon as the beetles were approached many dropped to the ground and thus they were scattered on the plants and on the ground. The two negro laborers killed every beetle in the field by applying sodium fluosilicate with a good dust gun.

Agricultural Experiment Station, Baton Rouge (H. Stoneberg) (No report)

MISSOURI

Agricultural Experiment Station, Columbia (L. J. Stadler) (No report)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer) (August 11)

Corn pollination which was begun July 17 was concluded today. The extremely hot, dry summer has interfered seriously with out work cutting down very materially the number of selfs and crosses. If abundant rains do not come very soon the cars already pollinated will not fill out. This condition is general throughout East Tennessee and is now so serious that its effects are beginning to be felt materially by business in general.

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins) (No report)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz) (No report)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (No report)

ILLINOIS

Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert) (No report)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (August 4)

During the past week the field scouts in Shelby County found a small area of escaped barberry bushes. The original planting consisted of only two large bushes. Two mid-sized bushes and 180 small seedlings were found growing in adjacent woodlands. The bushes were heavily rusted and had spread stem rust to oats and red top. The owner of the farm on which the barberries were found knew about the barberry eradication campaign in Shelby County and was expecting the field scouts to visit her property and inspect it for barberry bushes. Good publicity made it possible to find these barberries which were growing in a very out-of-the-way place and could very easily have been missed had the owner not known what they were and shown them to the men. The field scouts treated these bushes with salt.

The original survey of Douglas, Cumberland, and Moultrie Counties was completed during July. Not nearly so many bushes have been found in the territory being surveyed this year as were found in that covered last year.

A second survey is being conducted in parts of Lake and Cook counties where many new barberries have been located.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer) (No report)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains) (No report)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer) (No report)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (No report)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy) (No report)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson) (No report)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney) (No report)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt) [July 28]

Dr. H. K. Hayes, collaborator, writing of a recent trip through the spring-wheat area, states: Crops looked extremely fine to me, the corn crop being especially good. Winter wheat in Minnesota as a whole looked satisfactory around Waseca and the crop of durum wheat between Brookings and Webster, S. D., was very fine indeed. I saw no field of Marquis wheat in my journey from Brookings to Webster but around Webster several fields of Kota looked quite good although somewhat weak in the straw in some cases. From the Minnesota State line to Morris there is an unusually large acreage this year of Marquis wheat; this is severely infected with black stem rust. The fields that I looked at would be graded by us as having anywhere from 80 to 90 per cent of stem rust. The general viewpoint of the men whom I talked with at Morris and my own personal opinion based on this study convinces me that the damage in this section of our State from stem rust will be as high as 50 per cent, that is, I believe the yield will be cut down 50 per cent by stem rust in this section.

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman) (No report)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) (No report)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (August 15)

To date, August has been favorable for production of grain sorghums and broomcorn. A number of showers have occurred at intervals and kept the humidity high and the evaporation low. All the sorghums that were not too far advanced have made rapid growth and most varieties are heading at present. While drought during May and June interferes with seeding of the sorghums and

causes a fear that there will be no crop, yet, dry weather early in the season does not cause the damage to sorghums and broomcorn as the same dry conditions do in July and August. At present prospects are for an average or good crop of sorghums and about an average crop of broomcorn this season.

Work has been the selecting and bagging heads for seed, counting material in date of heading studies, and making some crosses.

September 12 will be Farmers' Field Day at the Station and if weather conditions be favorable a good showing of crops should be possible at that time.

Maximum temperature for first half of August, 95 degrees on the 11th; minimum for same period, 63 degrees on the 13th and 14th. Precipitation, 0.78 inch which occurred on five dates.

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker) (August 6)

July, 1925, was remarkable for the great extremes of temperature that occurred in Kansas and for the irregular distribution of rainfall. The first 19 days were excessively hot with the thermometer frequently about 100 degrees. The last 10 days were much cooler, which brought the average for the month close to normal. A temperature of 112 degrees occurred at two stations on July 18, a July record that has been exceeded in Kansas only five times since 1887.

On July 31, the thermometer was below 50 degrees in the north-central and western counties with a minimum of 39 degrees at Atwood in Rawlins County, which is the lowest July temperature recorded in the State in 20 years. Rainfall was exceedingly spotted and corn suffered greatly as a result of the excessive heat and general deficiency in rainfall the fore part of the month. It was tasseling and silking in the southern part of the State and almost ready to tassel in the northern counties when the hot weather occurred. In the western half corn was burned brown over extensive areas and a large per cent of it left in such condition that it could not recover with the cooler weather and showers the last days of the month. In the Kaw valley west to Junction City and thence north to the Nebraska line corn was in good condition. Corn was also in good condition in a few counties in the extreme northwestern part of the State.

Donald D. Hill, a graduate of Oregon Agricultural College, 1925, has been appointed instructor in Crop Improvement and will look after the cooperative cereal breeding work during the absence of the writer.

S. F. Kollar will continue as assistant in crop improvement and give special attention to the sorghum breeding project.

Several changes are being made in offices and laboratories occupied by the Agronomy Department in Waters Hall. The space formerly occupied by crop improvement teaching laboratory and by offices for Prof. S. C. Salmon and Dr. A. M. Brunson will now be devoted to the State seed laboratory which has been established at the college. Dr. Brunson and Mr. J. G. Willier will have the office and seed room formerly used by the writer. New offices and seed roomhave been provided for us on the first floor of Waters Hall which are more conveniently located and arranged than the old quarters.

Nursery threshing, including samples from the large winter wheat and spring oats nurseries at Manhattan, barley nursery at Colby and the soft red winter wheat nursery at Columbus was completed on August 1. Test weights and grain notes are now being taken and fall planting plans made up.

The wheat train known as the "Opportunity Special" operated by the Santa Fe Railroad and the Extension Service of this college, in cooperation with the Southwestern Wheat Improvement Association and Kansas Crop Improvement Association, was a decided success. The train made 43 stops in about 40 counties and carried its message by means of short talks and practical demonstrations to more than 100,000 people. Former president, H. J. Waters, secretary, J. C. Mohler, president, F. D. Farrel, Deans Harry Umberger and L. E. Call, Professors R. I. Throckmorton and L. E. Melchers, and a number of other college and station men were on the train for part or all of its two weeks' trip. Miss Vada Watson, popular Kansas Wheat Girl, was with the train on the entire itinerary.

The following tables made up from data supplied by Mr. M. M. Hoover, acting in charge of Prof. S. C. Salmon's field plat experiments, give data on the yields of hard and soft red winter wheat varieties and of winter x spring wheat crosses grown in triplicate plots at the agronomy farm. We were surprised to find that Newton x Turkey, C. I. No. 6935, yielded more than any other variety of hard red winter wheat. Kanred ranked second and yielded more than Blackhull. Tenmarq, a cross between P1066 and Marquis, was the only one of the winter x spring crosses that yielded more than the average of the Kanred checks. Among the varieties of soft red winter wheat Fulcaster and Harvest Queen made the best yields.

Yields of Winter Wheat Varieties
Three Plats at Agronomy Farm
1925

Hard Red Winter Series

C. I. No.	Kans. No.	Variety	Series I	Series II	Series III	Ave. of 3 plats
6935		Newturk (Newton x Turkey)	37.6	44.0	41.0	40.9
5146	2401	Kanred Checks	(3) 37.9	(3) 40.2	(3) 38.8	39.0
6205	373	H. W. Defiance	33.5	41.0	39.0	37.8
6251	343	Blackhull	36.2	36.3	39.7	37.4
5592	2382	Imp. Turkey	30.6	37.7	41.7	36.7
	2531	Kanred Sel.	35.2	38.0	36.7	36.6
	2529	Kanred Sel.	39.5	35.3	34.7	36.5
6249	321	Neb. No. 6	34.5	34.7	36.7	35.3
4430	2520	Sherman, C. I. 4430	31.5	36.3	36.7	34.8
1558	570	Turkey	30.3	35.3	38.0	34.5
5797	2048	Altera	32.8	33.3	36.7	34.3
6206	382	Kharkof	30.8	34.7	35.7	33.7
6934	431	Iobred	30.9	31.0	31.3	31.1

Winter x Spring Hybrid Wheat Series

Awn type	C.I. No.	Kans. No.	Variety	Series I	Series II	Series III	Ave. of 3 plats
B	6938	439	1066 X Marquis (Tenmarq)	38.8	41.0	44.3	41.4
		2401	Kanred (Checks)	(2) 37.8	(2) 37.9	(2) 39.9	38.5
B		442	1066 x Marquis	37.1	37.3	38.7	37.7
B		443	Marquis x Kanred	36.5	36.3	36.3	36.4
B		446	1068 x Preston	35.3	37.3	36.3	36.3
A	6937	440	Marquis x Kanred (Kanmarq)	33.7	34.7	38.3	35.6
A		441	Marquis x Kanred	33.3	33.3	36.0	34.2
B		445	1068 x Preston	32.6	31.0	38.0	33.9
A		449	Marquis x Kanred	34.1	32.7	34.7	33.8

Soft Red Winter Wheat Series

Kans. No.	C. I. No.	Variety	Series I	Series II	Series III	Ave. of 3 plats
2401	5146	**Kanred checks	(3) 27.3	(3) 28.7	(3) 31.0	29.0
317	6471	Fulcaster (8 pks. rate of seeding)	25.8	30.0	31.0	28.9
19	6199	Harvest Queen	25.1	29.3	31.0	28.5
317	6471	Fulcaster	25.5	30.0	28.3	27.9
435	6163	Shepherd	25.5	---	---	a 25.5
	3326	Currell	22.4	22.7	29.3	24.8
353	4343	Hussar	22.2	22.3	26.3	23.6
400		Penn. No. 44 (8 pks. seeding rate	17.4	26.3	25.3	23.0
34	5147	Nebraska No. 28	20.0	19.3	22.7	20.7
2084	6211	Zimmerman	19.5	9.0	19.0	15.8
		Mediterranean No. 31	13.6	16.2	---	b 14.9
	7364	*Turkey (Moro)	27.6	30.3	35.6	31.2
	7379	* (Mixed)	21.2	32.0	---	b 26.6

*These are hard wheats, included in soft wheat series because received and sown late, not entirely comparable with others.

**Hard wheat

a Only one plot b only two plots

The average yield of 18 Kanred checks grown in replicated rod rows grown in the 1925 nursery was 28.91 bushels. The average probable error obtained by averaging the individual probable errors for each of these 18 checks is 2.10 or about 7.3 per cent. This is a little larger than usual for nursery yield tests in which the average probable error has ordinarily been about 5 per cent. The land on which the nursery is now located and which has just been purchased by the station is not very uniform, there being quite a slope from one side of the nursery to the other. Strangely enough the best yields are made on the higher ground and the poorest yields on the lower ground. The average of the 18 Kanred checks in series one on the higher ground is 32.57 bushels, of the middle series, 28.63 bushels and of the third series on lower ground, 25.51 bushels.

The average yield of 8 Fulcaster checks is 25.77 bushels, the average probable error for these Fulcaster checks is 1.83 or 7.1 per cent, about the same as for the Kanred checks.

The yields of the 117 strains including checks grown in replicated rod rows ranged from 33.21 bushels for Kanred down to 14.53 bushels for Leap Prolific. This was decidedly a Kanred year in the nursery. The only varieties that made better yields than the average of the Kanred checks were Indiana Swamp, Honor, Turkey x Bearded cross from the Minnesota station, one of the Turkey x Ghirka crosses made at the Kansas station and five of the winter x spring crosses, three of which were awnless. Nursery yields of a few other well known promising or interesting varieties are given in the following table:

Kansas No.	C. I. No.	Name	Bu. per acre
2535		*Michigan Wonder	28.63
305	5408	*Triplet	28.33
353	4843	Hussar	28.24
382	2193	Kharkov	27.70
2536	6935	Newton x Turkey	27.24
2523		*Forward	27.07
		*Mediterranean No. 31	27.03
435	6163	*Shepherd	26.70
343	6251	Blackhull	26.61
19	6199	*Harvest Queen	26.18
		Average of 8 Fulcaster checks	25.77
2450	5149	*Minhardi	25.70
321	6249	Nebraska No. 6	25.62
430		*Currell	25.54
431	6934	Iobred	25.48
322	6250	Nebraska No. 60	25.37
2448	6155	Minturki	25.00
2156	625	*Fultz	24.95
Sel. No. 193827		*Illini Chief Sel.	24.11
2270	4430	Sherman	24.07
2250	1583-30	Karmont	23.76
34-5		*Nebraska No. 28	23.43
		Alberta Red	24.75
	*Soft Wheats	Michikov	24.22

Kansas. No.	C. I. No.	Name	Bu. per acre
2467	6153	Padui	22.94
2542	6690	Minard	22.20
2048	6211	*Zimmerman	21.88
2515		Berkeley Rock	21.73
2538	6688	Mosida	20.27
2331	3330	*Buffum No. 17	17.70
2543		Ridit	17.57
	6151	*Odessa	15.41

*Soft wheats

Nursery yields of rye varieties

Kans. No.	C. I. No.	Name	Bu. per acre
9075		Kansas	36.35
9084	181	Advance	32.50
9085		Dakold	32.42
9074	195	Rosen	26.47

Kansas rye has a better average yield over a period of years than any other variety and in 1925 yielded about ten bushels more than the celebrated Rosen rye.

A large number of the winter x spring crosses which have been tested in the nursery for a three-year period and found inferior to Kanred in yield and winter hardiness will be discarded. Quite a number of promising selections of Illini Chief x Kanred, Prelude x Kanred and Kanred x Hard Federation will be advanced to the replicated rod row series. Only a very few varieties of soft red winter wheat will be continued in the nursery at Manhattan. Most of the soft red winter wheat breeding work will hereafter be located at Columbus, Cherokee County, southeastern Kansas.

The writer expects to leave Manhattan on August 12 to spend three days at St. Paul, Minn., one day in Washington, D. C., and one day in New York, sailing from New York for Southampton and Cambridge, England, on August 19 to attend the meetings of the British Association and to spend a year in graduate study under Prof. R. H. Biffen at Cambridge.

Hays Branch Experiment Station, Hays (A. F. Swanson) (August 18)

The following are the yields of winter wheat varieties grown at this station:

Single plat and mean yields of winter wheat varieties replicated once on fallow and once on fall plowed land at the Ft. Hays Field Station, 1925.

C. I. No.	Variety	Fallow land Yield per acre, bu. Plat 1	Plat 2	Ave.	Fall plowed land Yield per acre, bu. Plat 1	Plat 2	Ave.	Mean
6251	Blackhull	21.2	25.4	23.3	7.9	8.7	8.3	15.8
6686	Kharkov, Hays No.2	22.1	22.1	22.1	5.8	5.8	5.8	14.0
5592	Improved Turkey	21.7	19.6	20.7	7.1	6.7	6.9	13.8
5146	Kanred Check	22.9	20.4	21.7	4.6	6.2	5.4	13.5
5146	Kanred	19.6	22.1	20.9	5.4	5.4	5.4	13.1
1558	Turkey	20.4	19.6	20.0	4.6	7.1	5.9	12.9
6249	Nebraska No. 6	20.4	18.7	19.6	6.2	6.2	6.2	12.9
1442	Kharkov	20.8	21.2	20.5	5.8	3.7	4.8	12.6
5250	Nebraska No. 60	21.2	17.9	19.6	5.4	5.0	5.2	12.4
6700	Karmont	18.7	18.3	18.5	5.4	5.8	5.6	12.1
5549	Kharkov Mont. 36	20.4	14.6	17.5	6.7	5.8	6.3	11.9
6471	Fulcaster	20.8	13.3	17.0	5.8	7.5	6.7	11.9
5147	Nebraska No. 28	19.2	12.1	15.7	7.9	7.9	7.9	11.8
5797	Altera	20.8	15.8	18.3	4.6	5.8	5.2	11.8
4430	Sherman	20.4	17.5	19.0	5.0	2.5	3.8	11.4
4843	Husser	18.3	13.7	16.0	5.4	5.4	5.4	10.7
6199	Harvest Queen	15.8	10.8	13.3	7.5	7.9	7.7	10.5
6155	Minturki	18.3	13.7	16.0	4.6	5.0	4.8	10.4

The following varieties were grown once on fallow land and once on cropped land, as a preliminary test to the regular varietal experiment.

Kans. No.	C.I.No.	Variety	Fallow land Yield per acre bu. Plat 1	Fall plowed land Yield per acre, bu. Plat 1	Ave.	Mean
	6251	Blackhull (check)	24.6	7.9		16.3
	5146	Kanred, Dupont No.17	23.3	5.0		14.2
	5146	Kanred (check)	22.1	5.8		14.0
	5146	Kanred, Dupont No.16	22.5	5.4		14.0
	6935	Newton x Turkey	21.7	4.6		13.6
	5146	Kanred, Dupont No.13	21.7	4.6		13.2
449		Marquis x Kanred (bearded)	19.6	6.2		12.9
Sel. 214868		Marquis x Kanred (awnless)	20.8	4.2		12.5
	6943	Iobred	20.0	4.2		12.1
441		Marquis x Kanred (awnless)	18.3	5.8	12.1	
	7379	Schrock Awnless	20.0	4.2	12.1	
	7364	Turkey (Moro, Ore.)	14.2	5.2	8.2	
		Clark's bulk				
		Marquis x Kanred	18.3	Single plat on fallow only		

COLORADO

Akron Field Station, Akron (No report)

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren) (No report)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (No report)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel) (No report)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) (No report)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel) (No report)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue) (No report)

Dickinson Substation, Dickinson (R. W. Smith) (August 15)

Harvesting in this vicinity is practically finished with the exception of flax. Some threshing has been done. Yields are comparatively low but the wheat threshed is reported to be of good quality.

Threshing of the cereal varieties was begun August 13. The varieties of rye, oats, and barley have been threshed. Threshing of wheat varieties will begin early next week. Yields have not been computed for all varieties threshed but they will be comparatively low.

Official visitors at the Substation recently were Mr. M. A. McCall, Mr. John H. Martin, Mr. K. S. Quisenberry, Dr. M. N. Levine, Mr. M. N. Pope and Mr. O. C. Kukula.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.) (August 17)

The first half of August has been generally very dry. Precipitation during this period was only .38 inch. The total rainfall during June amounted to 7.34 inches, all of which fell before June 23. From June 23 to date the total precipitation was only .71 inch.

The April 15 and May 1 seedings of the date-of-seeding-and-tillage experiment were harvested August 5, and the May 15 seeding on August 15.

The flax and cereal mixtures were harvested August 6.

Threshing of the wheat nursery has been delayed chiefly because the material was not yet dry enough but may be under way any time now. Threshing of the rotation plats began last week but is temporarily postponed because of showers this morning. Threshing of the cereal plats should be under way the latter part of this week or the first of next week.

Mr. A. C. Dillman completed his classification notes on flax and left August 11.

On August 14, with Messrs. M. A. McCall and E. R. Ausemus, we took a trip to the farm of Mr. Wilbert Field, seven miles east of Bismarck, to investigate a report of a severe rust infection on Kota wheat. The infection proved to be chiefly leaf rust with one per cent or less of stem rust. A neighboring field of Marquis, with a somewhat heavier infection of stem rust and practically no leaf rust, showed a striking comparison between the two kinds of rust.

Early varieties in the flax nursery plantings are ripening rapidly and some of them will be ready to harvest in about a week.

The following official visitors went over the cereal work at the station during this period: J. A. Clark, August 1; M. N. Levine and Karl Quisenberry, August 3; M. N. Pope, August 5; M. A. McCall and O. C. Kukula, August 14; J. H. Martin and H. L. Westover, August 17.

Maximum temperature for the first half of August was 96 degrees on the 5th of August; minimum, 46 degrees August 1.

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (No report)

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham) (No report)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe) (No report)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford) (No report)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (August 9)

Harvesting is nearing completion in eastern Oregon. Grain yields are somewhat higher than were expected two weeks in June. In Sherman County farmers are reporting yields of from 15 to 30 bushels per acre. In Gilliam and Morrow counties yields are not quite so high but the spring wheat crop in these counties is generally good. In Umatilla County, on the best land, farmers are reporting yields of from 40 to 50 bushels per acre of spring-sown Federation wheat. The area sown to Hard Federation and Federation spring wheats in eastern Oregon this year will approximate 400,000 acres. This is a much larger spring wheat acreage than normal because of the extensive winter-killing of fall-sown grains.

Threshing of the field plats is nearly completed on the station. Nursery threshing will begin this week. All fall-sown grains were completely winter-killed on the station but the varietal trial, tillage plats, and a portion of the nursery were reseeded early in February. The yields obtained from the winter wheat varieties were as follows:

	Yield bu. per acre		Yield bu. per acre
Triplet	33.6	Blackhull	27.7
Hybrid 123	33.3	Local Turkey	27.3
Federation	30.3	P1068 x Preston	27.3
Hybrid 128	29.7	Fortyfold	27.0
Argentine	29.5	Kanred x Marquis	27.0
Mosida	29.3	Sevier	27.0
Oregon No. 19	28.7	Turkey x Florence (G326W)	26.7
Alberta Red	28.5		
Sherman	28.3	Nebraska 60	26.0
Fortyfold x Hybrid 128	28.3	C. I. 3055A	26.0
White Odessa	28.0	Turkey 1571C (white)	25.9
Turkey 1571	28.0	Newturk	25.8
Kanred	28.0	Ridit	25.5
Turkey 1571C (purple)	28.0	Argentine 1569-2	25.3

The yields from the winter wheat varieties were higher than those obtained from the spring wheat varieties. The principal spring wheats in eastern Oregon this year are Hard Federation, Federation, Marquis, and Baart. On the station, the average yields obtained from these varieties from the varietal experiment, rate of sowing trials, and date of sowing trials are given below.

	Bu. per acre	Weight per bu.
Federation	27.1	54
Hard Federation	24.9	55
Marquis	21.5	56.5
Baart	20.3	57

Farmers generally are reporting higher yields from Federation and Hard Federation than from Marquis, but Marquis generally is of better quality this season.

We enjoyed a visit from Dr. C. R. Ball on the 7th and 8th.

CALIFORNIA

Biggs Rice Field Station, Biggs (J. W. Jones) (No report)

University Farm, Davis (V. H. Florell) (No report)

Agricultural Experiment Station, Berkeley (F. N. Briggs) (No report)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 21

August 31, 1925
Personnel (Aug. 21-31) and Project Issue

PERSONNEL ITEMS

William E. Brentzel, assistant pathologist in flax-disease investigations being conducted by this Office at Agricultural College, N. Dak., since July 1, 1919, resigned effective August 31, to accept a position as pathologist at the North Dakota Agricultural Experiment Station. His appointment as collaborator has been requested effective September 2.

A. C. Dillman, associate agronomist in charge of flax investigations, states that he left Mandan, N. Dak., August 11. He spent August 12 at Fargo, N. Dak., in consultation with Dr. H. L. Walster and Mr. T. E. Stoa in regard to experimental work with flax and the conditions of the crop. August 13 to 21 he spent at University Farm, St. Paul, Minn., working with Prof. A. C. Arny on the classification of flax varieties. He returned to Washington on the morning of August 23.

Dr. H. B. Humphrey, senior pathologist in charge of rust investigations, left Washington on July 31 for a tour of inspection of the uniform oat and wheat rust nurseries located at various points in Ontario, Quebec, and the maritime provinces of Canada. He was joined at Guelph, Ont., by Dr. E. C. Stakman, of University Farm, St. Paul, Minn., who continued with him throughout the Canadian portion of his itinerary.

Through previous arrangement, cooperative uniform rust nurseries had been established at Guelph and Ottawa, Ont., Ste. Anne de la Pocatière, Que., Fredericton, N. B., Kentville, N. S., and Charlottetown, P. E. I. Doctors Humphrey and Stakman made observations and took notes on these nurseries and collected representative specimens of rusted wheat and oats. Observations also were made on the occurrence of oat blast and of other cereal diseases at the various points visited.

Upon completion of the inspection of the various Canadian nurseries, Doctor Humphrey left Doctor Stakman at Montreal and returned to the United States by way of Burlington, Vt., where he joined his family for a brief vacation. He returned to Washington the evening of August 24.

Doctor Stakman completed the journey from Montreal to St. Paul without further stop.

Dr. A. G. Johnson, senior pathologist in charge of cereal disease investigations, left Washington August 24 for Wilmington, Del. At Wilmington he met Dr. G. N. Hoffer of Purdue University, La Fayette, Ind., and together with Mr. J. Hunter Gooding, Jr., of the Dupont Company, inspected the corn disease seed treatment experimental plats near Wilmington. The experimental laboratory where the various seed treatment compounds are given preliminary trials was visited also.

M. A. McCall, agronomist in charge of cereal agronomy investigations, returned August 24 from a field trip through the western States. Mr. McCall was in the field from July 5 and visited the following stations, at most of which cooperative experiments were being in progress: Ames, Ia.; Lincoln, Nebr.; North Platte, Nebr.; Aberdeen, Idaho; Moro and Corvallis, Ore.; Puyallup, Prosser, Lind, and Pullman, Wash.; Moscow, Idaho; Bozeman, Moccasin and Havre, Mont.; Dickinson and Fargo, N. Dak.; St. Paul, Minn.; Madison, Wis., Champaign and Bloomington, Ill.

Two weeks of the period in the field were spent at Lind, Wash., working on manuscripts in connection with experimental results secured at that station before Mr. McCall's connection with the Office of Cereal Investigations. A part of this work was cooperative with the Office.

A large part of the crop in the States of Oregon and Washington was spring sown during the current season, the winter of 1924-1925 being one of the most severe on record so far as winterkilling of fall sown grain was concerned. In the drier areas early season conditions were ideal and prospects until the crop had reached the soft dough stage favored an unusually large yield. Hot weather during June and early July, however, caused the grain to fill poorly and quality and yield were both reduced as a result. In the earlier districts of eastern Washington this reduction was less pronounced than in those slightly later, and one of the best crops of recent years was harvested in the territory tributory to the Adams Station at Lind. The milling quality of this crop is excellent and Big Bend Baart is commanding a substantial market premium.

The present season will place the farmers in a better economic condition, production being now confined to its more proper limits. As a result of the weeding-out process of the past several years, it is reasonable to expect the development of a more healthful agricultural condition in this locality.

T. R. Stanton, agronomist in charge of oat investigations, returned to Washington August 29 from an extended field trip.

VISITORS

Prof. N. Schmitz, in charge of extension agronomy, and H. B. Musser, extension agronomist, Pennsylvania Agricultural Experiment Station, State College, were Office visitors August 31.

Dr. E. R. Schulz, formerly agent of this Office in barberry eradication at Madison, Wis., was an Office visitor August 26 and 27.

MANUSCRIPTS AND PUBLICATIONS

Page proof of article, entitled "Associations Between Number of Kernel Rows, Productiveness, and Deleterious Characters in Corn," by Curtis H. Kyle and Hugo F. Stoneberg, for publication in the Journal of Agricultural Research, was read August 24.

Department Circular 356, entitled "The Common Barberry and How to Kill It," by F. E. Kempton and Noel F. Thompson, dated July, 1925, was received August 27.

The article, entitled "Variation in the Kherson Oat at Akron, Colo.," by F. A. Coffman and T. R. Stanton, appears in the Journal of Agricultural Research, vol. 30, no. 11, p. 1063-1082. June 1, 1925.

PROJECT REPORTS

EASTERN WHEAT INVESTIGATIONS

(Dr. C. E. Leighty, Agronomist in Charge)

Report of Cooperative Wheat Variety Tests Harvested in 1925[1/]

Hard Wheat Belt

In the hard wheat belt including approximately the western three-fourths of the State the results of the tests show that conditions differed decidedly from north to south across this portion of Kansas State. A line extending along the divide between the Arkansas and Smoky Hill rivers separates the region into a north section in which 15 tests were made, and a south section in which there were 20 tests.

The average yields of wheat in the two sections of the hard wheat belt are shown in the following tables:

South Section

Variety	Yield in Bushels per Acre
Blackhull	17.9
Fulcaster	16.1
Kanred	16.0
Turkey	15.5
Kharkof	15.2

North Section

Variety	Yield in Bushels per Acre
Blackhull	16.5
Kanred	15.8
Kharkof	15.0
Turkey	14.7
Fulcaster	14.5

1/ The tests reported were made cooperatively by farmers, County Farm Bureaus, Vocational Agriculture Schools and the Kansas State Agricultural College.

Soft Wheat Belt

The region where varieties of soft wheat are adapted is somewhat irregular, but in general is included in the three tiers of counties along the east end of Kansas, except in the southern part of the State and on bottom land where it extends somewhat farther west.

In 18 tests in this territory Blackhull, the highest yielding variety, made 25 bushels to the acre this year. Michigan Wonder, Fulcaster, Harvest Queen and Kanred all yielded nearly the same, making 3 to 3.5 bushels less than Blackhull.

Yields of varieties of wheat in Eastern Kansas are given in the following table:

Variety	Yield in Bushels per Acre
Blackhull	25.0
Michigan Wonder	22.0
Fulcaster	21.6
Harvest Queen	21.5
Kanred	21.4
Currell	20.6
Turkey	20.1
Fultz	19.7
Poole	19.4

WESTERN WHEAT INVESTIGATIONS

(J. Allen Clark, Agronomist in Charge)

On July 1, the vacancy which has existed in the leadership of the Grain Sorghum project since the transfer of Mr. B. E. Rothgeb to the Bureau of Agricultural Economics was filled by the appointment of Mr. John H. Martin, associate agronomist in western wheat investigations.

Mr. Martin has been on the staff of the Office of Cereal Investigations since September, 1914, from that date until April, 1918, being in charge of the cooperative investigations at Newell, S. Dak. From April, 1918, to February, 1919, he was superintendent of the Harney Branch Experiment Station at Burns, Ore. From February, 1919, to July 1, 1925, he has assisted in the western wheat project. During the time that he has been in the Office, his experience has been a very wide and valuable one, covering practically all of the northern and western United States where wheat is grown. Within this period, he has been sole or joint author of 18 Department publications.

Mr. Martin spent the period between July 1 and September 1 in cleaning up work already under way in the western wheat project, and, on September 1, will start on a tour of the sorghum-producing areas of the south-central Great Plains. During the coming winter, he expects to complete graduate studies at the University of Minnesota, looking toward the degree of Doctor of Philosophy, majoring in biochemistry and plant physiology.

He expects to assume an active part in the grain sorghum program beginning with the season of 1925. The grain sorghum project offers special opportunities, and, in view of Mr. Martin's training and experience, it is hoped that many of the special problems of this interesting crop, particularly those of a physiological nature, may be attacked.

On August 1, Mr. Karl S. Quisenberry was appointed pending certification, associate agronomist in western wheat investigations, to take the place of Mr. John H. Martin.

Mr. Quisenberry was granted his B. S. degree at the Kansas State Agricultural College in 1921 and the M. S. degree by the University of Minnesota in 1925. While at the Kansas State Agricultural College, from 1917 to 1921, he was student assistant and foreman of the cereal nursery maintained in cooperation with this Office. From 1921 to July 31, 1925, he was instructor in agronomy and assistant agronomist at the West Virginia University and Agricultural Experiment Station, spending the winter of 1924-1925 on leave in graduate study at the University of Minnesota. Mr. Quisenberry's experience has included teaching and investigational work in plant breeding and in genetics of wheat and oats.

Upon assuming his new duties in this Office, Mr. Quisenberry proceeded from Washington to Mandan, N. Dak., where he conferred with Mr. Clark. From there he proceeded to Dickinson, N. Dak., and Moccasin, Mont., at which points, with Mr. Martin, he spent several weeks in studying, harvesting and seeding winter-hardiness wheat breeding nurseries, together in cooperation with Mr. R. W. Smith at Dickinson and Mr. R. W. May at Moccasin. He will return to Washington September 5.

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CEREAL COURIER

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 22

September 10, 1925
Personnel (Sept. 1-10) and Field Station (Aug. 16-31) Issue

PERSONNEL ITEMS

Dr. Carleton R. Ball, senior agronomist in charge, returned to Washington September 6 after a very pleasant and profitable trip for some 2,600 miles by automobile in the three prairie provinces of Canada. The survey party started from Poplar, Mont., on August 12 and returned to Shelby, Mont., on September 2. The purpose of the trip was to study the correlation between soil, climate, native vegetation, and crop production and from this standpoint the expedition was an unqualified success. The fine spirit of cooperation and courtesy shown by the representatives of the Dominion Ministry of Agriculture and the Dominion experiment stations and those of the Universities of Saskatchewan and Alberta was most helpful and appreciated. A full account of the findings will be made available later.

C. E. Chambliss, associate agronomist in charge of rice investigations, left Washington September 2 to travel in Alabama, Arkansas, Florida, Georgia, Louisiana, Missouri, North Carolina, South Carolina, Texas, and Virginia. He will confer with experiment station officials and others interested in rice investigations and will inspect experiments being conducted at the Crowley Rice Field Station.

F. A. Coffman, associate agronomist in oat investigations, returned to Washington August 31 after an extended field trip of about two and one-half months in the interests of oat investigations.

During his absence he visited points in Colorado, Idaho, Illinois, Iowa, Kansas, Minnesota, Montana, Nebraska, North Dakota, Utah, Wisconsin and Wyoming. Mr. Coffman spent about six weeks at the Aberdeen Substation where he was engaged in making oat crosses and assisting in harvesting and recording data on the large oat breeding and identification nurseries being grown at that Station.

Mr. Coffman also spent two days at the Dickinson Substation, N. Dak., where he assisted Mr. R. W. Smith in harvesting the oat-smut experiment being conducted at that station.

Dr. F. E. Kempton, pathologist in charge of barberry eradication, returne to Washington September 5 after an extended field trip of about two months in the 13 barberry eradication States.

He reports that in the original survey the work in Ohio and Michigan is progressing much slower than had been anticipated in that there are large areas of escaped barberries being found in each county. Most of these findings could not have been located except by the careful strip survey that has been carried on over each farm. Most of the original bushes or hedges from which these areas of escapes developed had been destroyed some years ago.

Progress of original survey in the other two States, Illinois and Montana where this phase of the work is being carried on, is proceeding according to schedule. However, escaped barberries have been found in Montana along the Yellowstone River and many infected bushes have been found in each of the counties as the survey in Illinois proceeds southward.

The second survey is in progress in the other nine States. Counties that were covered in the original survey during 1919, 1920-21, are being covered a second time with the result that through careful foot survey almost a third as many plantings per county are being found as in the first survey. Many of these barberries could not have been located except by careful foot scouting of all woodlands, fence rows and stream banks of each farm.

Naturally, the survey is going very slowly in that it takes a great deal of time to survey each farm carefully on foot. Automobiles and trucks are used for transporting the men between farms and for hauling salt and kerosene for killing of bushes.

In addition to the wild area of bushes located along the Yellowstone River in Montana a rather large area of escapes has been located in northern Nebraska along the Missouri River and additional areas of escapes in Iowa and South Dakota. In Dane County, Wis., is the largest area of escaped barberries found to date. Four men have been employed to survey this area on foot during the summer months for three years. It is estimated that it will take another summer to reach the outer edges of this area of escapes. So far the area covered is about 13 x 20 square miles.

A large area of escaped bushes in Manistee County, Mich., covers about 48 square miles. One area of escapes in Geauga County, Ohio, extends over about two townships. In this same county there are three other areas of escaped bushes and in an adjoining county, which is only partially surveyed, three areas of escaped bushes covering at least 10 square miles each have been found.

The observations of this trip indicate that the survey during the early parts of the campaign was not thorough enough. On the second survey practically all farms must be carefully covered on foot in order to certify that these farms are free of barberries. The results so far this summer indicate that there is a large amount of barberries still remaining in the barberry eradication area. This campaign is only well begun. It will take a number of years to complete a careful second survey and many more years to eliminate all the sprouts and seedlings from areas of escapes.

M. A. McCall, agronomist in charge of cereal agronomy investigations, left Washington September 9, en route for the following stations: Woodward and Lawton, Okla.; Chillicothe, College Station, Beaumont, and San Antonio, Tex.; Crowley, La.; Tucson, Sacaton, and Yuma, Ariz.; Bard, El Centro, Riverside, Carney Park, Shafter, Berkeley, Davis, Biggs, and Cortena, Calif.; and Hays and Manhattan, Kans.

He will confer with the experiment station officials and field personnel regarding cooperative experimental work now in progress or planned in the south central, southwestern, and western United States by this Office. Mr. McCall will be in the field about five weeks.

VISITORS

Dr. Joseph Burrt Davy, formerly in the service of this Department, and for the past 20 years with the Transvaal and South African Union Departments of Agriculture, has been visiting institutions in the United States during the past few weeks. He was a caller at the Office on September 9 and 10. He is now in charge of the newly created Institute of Forestry established by the British Minister of Agriculture at Oxford University, England. He was accompanied by Mrs. Davy.

Dr. S. H. Essary, botanist of the Tennessee College of Agriculture and the Agricultural Experiment Station, was an Office visitor September 4.

Dr. V. Lathouwers, in charge of agronomy of the agricultural school at Gembloux, Belgia, spent September 2 to 5 consulting with various officials of the Department in the interests of his country. He spent two years in the Belgian Kongo, and has been in this country since March, spending most of the time at Cornell University. Doctor Lathouwers is particularly interested in plant breeding and in cereals, potatoes, cotton, and in the organization of the Department.

MANUSCRIPTS AND PUBLICATIONS

The article, entitled "Physiological and Biochemical Studies on Cereals. IV. On the Presence of Amino Acids and Polypeptides in the Ungerminated Rye Kernel," by S. L. Jodidi and J. G. Wangler, appears in the Journal of Agricultural Research, vol. 30, no. 10, p. 989-994. May 15, 1925.

Department Bulletin 1284, entitled "Sorghum Smuts and Varietal Resistance in Sorghums," by George M. Reed and Leo E. Melchers, dated August, 1925, was received September 5.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA
State College of Agriculture, Athens (R. R. Childs)

VIRGINIA
Arlington Experiment Farm, Rosslyn (J. W. Taylor)

NEW YORK
Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA
Rice Experiment Station, Crowley (J. Mitchell Jenkins)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg)

MISSOURI
Agricultural Experiment Station, Columbia (L. J. Stadler)

TENNESSEE
Agricultural Experiment Station, Knoxville (L. S. Mayer)

IOWA
Agricultural Experiment Station, Ames (M. T. Jenkins)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz)

Iowa State College, Ames (Barberry Eradication, M. A. Smith)

ILLINOIS
Funk Bros. Seed Company, Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran)
(September 5)

The original survey of Edgar, Clark and Montgomery Counties was finished in August. Most of the field men are now working in western Illinois in the vicinity of Jacksonville.

One of the most successful features of the Illinois campaign this year has been the educational work carried on through the newspapers. An agent, designated to handle this phase of the campaign, is kept informed by the scouts in the various counties. Each week an original article concerning the activities of the barberry scouts who are working in that territory is mailed to each local paper. Editors are anxious to publish news articles

with local color and this plan has met with excellent success in Illinois.

Three sets of demonstration material were assembled during August for use at county fairs and farm bureau picnics. All the posters, signs and other publicity material were mounted on beaver board to facilitate putting up and removing the demonstrations. The Conference for the Prevention of Grain Rust has rendered excellent cooperation in furnishing material for the demonstrations. The Washburn Crosby Company furnished 30 pounds of No. 1 Hard Winter wheat testing 62 pounds per bushel for use in making up display samples of healthy wheat.

Two scouts have spent almost all their time since the middle of June in completing the eradication of the escaped area of barberries on the Lake farm near Gurnee. Seedlings are numerous and it is necessary for the scouts to crawl on their hands and knees under every tree and shrub to locate and destroy them.

A large amount of stem rust material has been collected this summer. Plans are being made to carry on a school campaign this fall. Literature and specimens of rusted cereals and barberries will be distributed to schools to aid in identifying the stages of stem rust.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (August 31)

In original survey it has been possible to cover territory equivalent to only one and three-fourths counties, by the "Every woodlot scouting method," with 26 men since July 1. This method seems very slow in comparison with the method which was used on original survey prior to this year and, of course, the cost per county increases as the rate of survey decreases. It seems clear that the method being used is justified even if the cost has increased. Many barberry bushes are being found in places where they never would have been found by survey methods employed in past years.

The work in Columbiana County substantiates this contention. Columbiana County is one in which was thought there were only a few, if any, barberry plantings. When our crew of scouts began work in that county, early in July, no one seemed to know of the location of barberries and comparatively few of the natives had heard of such bushes. The intensive survey has produced data which throws a different light on the situation. Only about 20 per cent of the county has been covered but 26 locations with a total of 1285 escaped barberry bushes and several cultivated bushes have been found and the bushes destroyed.

The scouts working in four townships of Geauga County have found about 70 farms upon which thousands of escaped barberries are growing. They have used a carload of salt and much more will be necessary to kill all of the bushes found to date.

The scouts working in western Trumbull County have just discovered an area, comprised of 10 farms, near Mesopotamia where at least 2,000 escaped barberry bushes are growing. Six hundred of these are large bushes.

The damage to wheat in Ohio from black stem rust will probably be less than one per cent for this year. Stem rust on oats is rather general, particularly in northeastern Ohio. In this same region stem rust on red top and timothy is general. The rust on oats came late but caused considerable damage in at least a few cases.

Barberry eradication fair demonstrations have been held at Jefferson and Kinsman. Two demonstrations have been placed at the Ohio State Fair which is now in progress. One demonstration was placed with the College of Agriculture exhibit and one with the Ohio Department of Agriculture. Mr. G. D. George, from University Farm, St. Paul, Minn., assisted in preparing the State Fair demonstration.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker) (August 24)

The average number of barberries found on new properties on second survey in southern Wisconsin is about the same as was found in other counties previously. Several thousand bushes have been eradicated in Jefferson, Waukesha, and Rock counties. The large numbers of lakes and resorts in these counties greatly increase the amount of territory requiring intensive scouting. Escaped bushes and seedlings have been found quite generally in the vicinity of previously planted bushes.

Stem rust has been found spreading from barberries to oats in several locations in southern Wisconsin. Heavy losses on oat fields in the immediate vicinity of barberries have been noted more than usual this year. The spreads have been quite local, probably because the small grains ripened early. Last year the grains ripened about three weeks later, and we found the spreads of stem rust to be over larger areas.

It seems apparent that we have found the source of the stem rust on oats which spread north from Calumet County in 1924. Several locations of planted and escaped barberries were found in the southern part of Calumet County in the second survey this year. These bushes were heavily infected with the oats strain of stem rust. The stem rust on oats was much lighter in these same areas this year.

The publicity work has been carried on as usual. The movie film is kept in use in the field; letters have been sent to all rural property owners in the area being surveyed; newspapers have been publishing our stories regularly; demonstrations are to be held at all county fairs in the territory being scouted, and window demonstrations are set up in every town.

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (August 31)

Dry, hot weather has returned and crops need rain badly. The three earlier dates of broomcorn were harvested on the 17th. The brush was short but of fair quality. Today, August 31, the earlier dates of Feterita, Dwarf milo, Sunrise and Reed kafirs are being headed. The yields from these earlier dates will be light. The varietal and rate sorghums are in good condition and better than average yields should be obtained this season.

On August 23, the writer drove to Hays, Kans.; on the 24th, inspected the sorghum experiments, and returned to Woodward on the 25th. North of Woodward, in both Oklahoma and Kansas, a large acreage of feterita was observed. It appeared to constitute about 50 per cent of the sorghum acreage in that vicinity this season.

Messrs. Leppan and Liebenberg of the University of South Africa, Pretoria, were station visitors on the 19th.

Maximum temperature for last half of August, 103 degrees on both the 17th and 18th; minimum, 56 degrees on the 26th. Precipitation for last half of August, 0.01 inch, and 0.79 inch for the month.

KANSAS

Agricultural Experiment Station, Manhattan (J. H. Parker)

Hays Branch Experiment Station, Hays (A. F. Swanson) (September 1)

August as a whole was a good month with timely rainfall and favorable weather conditions for all rowed crops, except corn which was hurt by the July drought.

In this particular section the sorghum crop will probably be the largest since 1915. The earlier maturing sorghums are now beginning to ripen.

Three plantings on three different dates were again made this year of all varieties of sorghums grown in the varietal test. The plantings were made within a period of 25 days and at such a time that all varieties would have a chance to mature regardless of time of planting. This method of planting has been most interesting and profitable in studying the effect of climatic conditions on the sorghums at different stages of growth.

During the last three weeks much time has been spent in bagging sorghum heads for next year's planting, in making crosses and in taking notes. During the next three weeks considerable time will be spent in making head selections.

The station has some excellent fields of Pink kafir, Dawn kafir, Dwarf Yellow milo, feterita and Early Sumac for seed which will be distributed to the farmers of western Kansas. The fields have been carefully rogued whenever needed and at proper times. Last year over 150,000 pounds of seed were sold to the farmers from this station. A greater demand for seed is expected this year.

Farmers have had the opportunity of preparing good seedbeds for their wheat crop this fall. Because of early rainfall there has been considerable volunteer wheat but the farmers have been more diligent in destroying it this year. Wherever volunteer wheat is on the ground it has already become badly infested with Hessian flies.

Mr. T. R. Stanton of the Office of Cereal Investigations, and Mr. J. B. Sieglinger of the Woodward (Okla.) Field Station were recent station visitors.

COLORADO

Akron Field Station, Akron

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger)

Redfield: The following report has been received from Mr. Samuel S. Garver, Office of Forage Crop Investigations, of varietal experiments grown in duplicate 3/80th acre plats at the Redfield Station.

Class & Variety	C.I.No.	Percentage stem rust[1/]	Average yield (bu.)
Durum			
Acme	5284	T	24.4
Nodak	6519	2	24.0
Pearson		20	23.6
Akrona	6881	25	22.7
Kubanka	1440	10	18.8
Hard Red Spring			
Ceres (Marquis x Kota)	6900	40	19.5
Marquis x Iumillo	6887	25	17.8
Kota	6248	3	15.6
Marquis	3641	90	11.9
Kanred x Marquis (B8-11)	7370	90	10.3
Preston	3081	95	7.4
Ruby	6047	65	6.9

[1/] Estimates made by Dr. M. N. Levine.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue)

Dickinson Substation, Dickinson (R. W. Smith) (August 31)

The threshing of all cereal varietal plats at the Substation is completed with the exception of prosos and the rate-and-date-of-seeding experiment with spring wheat varieties. The yields from the replicated plats of spring wheat and of winter wheat are given below.

The varieties of hard spring wheat outyielded those of durum which is rather unusual at this station. The yields from the few varieties grown in single plats are not entirely comparable with those from replicated plats as the former had a slight advantage in the matter of soil moisture.

The winter wheat varieties protected in winter by standing cornstalks outyielded the spring wheat varieties. This has occurred but three times in 11 years. The eight varieties sown in standing corn averaged 25.7 bushels per acre, while the same varieties sown in oat stubble averaged 14.5 bushels per acre.

Last week, with the valuable assistance of Mr. K. S. Quisenberry, the nursery of winter wheat hybrids and varieties was threshed and the new nursery for 1926 was sown. The latter nursery contains 30 rows 5-1/2 rods in length, 654 18-foot rows, 474 5-foot rows, and 200 8-foot rows. The actual seeding of this nursery was accomplished in six hours by two men. A third man gave some assistance in marking off and staking the rows. The maximum temperature was 95 that day.

In the preceding week Mr. F. A. Coffman, with some assistance from the station force, counted the number of diseased and normal panicles in about 7,000 F_3 Markton x Swedish Select oat hybrids in a study of the inheritance of oat smut. The maximum temperature was 102 on one of the two days devoted to this work.

Threshing in this vicinity is in full swing and wheat yields of from 7 to 15 bushels have been reported.

Official visitors at the Substation since August 15 were: Mr. K. S. Quisenberry and Mr. F. A. Coffman from the Cereal Office; Dr. H. L. Westover from the Forage Crop Office, and Mr. Thomas Killand from the Mandan (N. Dak.) Field Station. Mr. Fred D. Richey is expected today.

Yields of Spring Wheat varieties grown in plat experiments at the Dickinson Substation in 1925.

Common 4 plats of each Variety	C. I. No.	Yield (Bu. per acre)
Ceres (Marquis x Kota)	6900	20.1
Marquis x Kanred (B 8-11)	7370	20.1
Marquis x Kanred (B 9-14)	7372	20.1
Preston	3081	19.9
Power	3697	19.9
Red Fife	3329	19.3
N. D. R. 74 (Kota)	8024	18.7
Marquis x Kanred (B 9-11)	7371	18.7
Red Bobs	6255	17.5
Quality	6607	18.6
Marquis x Kota (1656)	6898	17.6
Marquis	3641	17.4
Kota	5878	17.4
Haynes Bluestem	2874	17.1
Progress	6902	16.7
Ruby	6047	16.2
Marquis x Iumillo (D-15-44)	6887	14.9
Hard Federation	4733	11.1

Durum 4 plats of each Variety	C. I. No.	Yield (Bu. per acre)
Pentad (D-5)	3322	17.6
Kubanka No. 99		15.7
Monad (D-1)	3320	15.6
Nodak (Kubanka No. 98)	6519	15.5
Kahla	5529	14.9
Kubanka	1440	14.5
Mindum	5296	14.1
Nohola	8025	13.9
Mondak (Kubanka No. 74)	7287	13.7
Akrona	6881	13.6
Durum 1 plat of each		
D-46		24.2
Kubanka No. 132		15.4
Common 1 plat of each		
Kota x Kanred (bulk)		22.1
Ulka	7347	18.5
Kota	5878	17.6
Haynes x Emmer		15.8
Marquis x Ruby (bulk)		14.1

Yields of winter wheat varieties grown in duplicate plats on the Dickinson Substation in 1925.

C.I.No.	Variety	Yield (Bu. per acre) In standing corn	In oat stubble	Average
5146	Kanred	27.6	18.6	23.1
1583	Kharkof	28.1	14.7	21.4
1543	Beloglina	26.2	15.9	21.1
1571	Turkey	27.0	15.0	21.0
6155	Minturki	25.9	15.1	20.5
6700	Karmont	25.3	13.3	19.6
3330	Buffum No. 17	23.8	11.0	17.4
5149	Minhardi	21.5	12.4	17.0
	Average	25.7	14.5	20.1

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr., and E. R. Ausemus) (September 2)

The last half of August has been very warm generally. Maximum temperature for the period was 101 degrees August 23; minimum, 41 degrees August 24; precipitation, 0.93 inch.

The oat and barley varietal plats and some of the wheat varietal plats were threshed August 20 and 21. Threshing was delayed on account of showers. Threshing of the remaining wheat varietal plats was completed August 24.

Threshing of the flax and cereal mixtures and the first three seedings of the date-of-seeding-and-tillage experiment was completed August 25. Yields will not be available until the seed is cleaned in the fanning mill.

About a third of the flax nursery planting on flax-sick soil was ripe and harvested August 26 and 27. About a third more is nearly ready to harvest.

Threshing of the wheat nursery, delayed because of showers and other work, was completed today.

The meetings in Mandan and Bismarck of the Great Plains Section of the American Society of Horticultural Science and the North Dakota State Horticultural Society, August 26-28, afforded an interesting program.

During the last half of August the station was visited by the following men: Mr. H. L. Westover and Mr. J. H. Martin, August 17; Mr. A. W. Henry, August 19; Mr. F. A. Coffman, August 24; Mr. F. D. Richey, August 29-31.

The following yields were obtained from the plat experiments with varieties of wheat, oats and barley. The season was characterized by a cool dry spring followed by abundant rainfall in June (7.3 inches). From June 22 to harvest there was only a third of an inch of rain, resulting in premature ripening and reduced yields. A week of extreme heat apparently damaged Kota more than other midseason varieties of wheat. Stem rust was not a factor for yield of varieties in plats although it did considerable damage to susceptible varieties in the nursery. Spring frost and early May drought apparently hurt the stands of Quality and Hard Federation.

Yields of wheat, oats, and barley varieties grown in replicated plats at the Northern Great Plains Field Station in 1925.

WHEAT

Class and Variety	C. I. No.	Acre yield (bu.)
Durum		
Mindum	5296	19.2
Nodak	6519	18.4
Monad	3320	18.2
Kubanka	1440	17.4
Akrona	6881	16.6
Mondak	7287	16.1

WHEAT

Class and Variety	C. I. No.	Acre yield (bu.)
Hard Red Spring		
Marquis x Kanred (1718 B 3-14)	7373	16.8
Preston	3081	16.8
Marquis x Kanred (1718 B 8-11)	7370	16.0
Power	3697	15.6
Marquis x Kota (1656)	6898	15.5
Ceres (1658)	6900	15.4
Marquis	3641	15.2
Marquis x Iumillo (D-15-44)	6887	14.2
Marquis x Kanred (1718 B 9-14)	7372	14.1
N. D. R. No. 74 (Kota)	8024	13.6
Red Bobs	6255	13.5
Kota	5878	13.4
Ruby	6047	12.0
White		
Quality	6607	8.6
Hard Federation	4733	7.9

OATS

Gopher	2027	64.6
Markton	357-1	63.5
Siberian	741	59.6
Lincoln 768	738	59.2
Swedish Select	134	57.7
Sixty Day	165	57.5
Victory	560	49.7
Iogren	2024	49.6
Golden Rain	493	48.8
Liberty Hulless	845	40.9

BARLEY

Svanhals	187	35.4
Hannchen	551	33.6
Manchuria	354	32.5
White Smyrna	195	30.6
Coast	698	30.4
Mariout	261	23.9
Single plat		
Odessa	182	34.6
Featherston		32.6

Wheat varieties follow sorghum.
Oat and barley varieties follow corn.

MONTANA

Judith Basin Substation, Moccasin (R. W. May)

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens) (August 31)

No extremely high temperatures were recorded at Moro in August and the month, like July, was without rainfall. In fact, we have had no precipitation of any consequence since the first week in May. The total precipitation for the three months of June, July and August was only 0.21 inch.

Farmers have had ideal weather for harvest and the work in the Columbia Basin counties is about completed. Mr. Bayles finished the threshing of the nurseries on the 21st. In addition to the rather extensive nursery on the station, we have seven dry-land nurseries in representative sections of the Columbia Basin Counties and one under irrigation near Prineville in central Oregon. The work with most of these nurseries is carried on in cooperation with the county agents. At all of them the grains are harvested and brought to Moro for threshing. In these nurseries are included more than 30 winter wheat varieties and selections, 25 of spring wheat, 8 of barley and 5 of oats, in addition to a few flax and field pea varieties. Practically the same varieties are grown in all nurseries. The varieties also are grown at the Branch Station at Burns under irrigation and under humid conditions at Corvallis.

In addition to the interesting results obtained from these nurseries, they have afforded a means of contact with farmers in the various localities. Successful field days were held this season at all nurseries, with an attendance of from 20 to more than 100 farmers.

The accompanying tables give the yields of the spring wheat, barley and oats in the varietal trials on the Station. Considering the fact that the total precipitation for the five-month period, March 1 to July 31, was only 3.53 inches, the spring grain yields, especially of barley, are considered rather remarkable. In pounds per acre, spring barley considerably outyielded all grains, including winter wheat.

Acre yields, in bushels, of spring barley varieties grown at Moro, Ore., in 1925, in quadruplicate 1/40 acre plats

C. I. No.	Variety	Acre yields, bushels Series 1	2	3	4	Average
261	Mariout	47.5	56.7	55.0	53.3	53.1
1256	Arequipa	40.8	61.7	50.0	54.2	51.7
935	Peruvian	43.3	55.8	43.3	60.8	50.8
1311	Flynn	50.8	57.5	45.8	48.7	50.7
2302	Peru	46.7	54.2	43.3	55.0	49.8
658	Smyrna	53.3	52.5	37.5	52.5	49.0
190	Beldi	52.1	38.3	45.8	50.8	46.8
2301	Coast	38.3	49.6	50.8	45.8	46.1
	Coast Sel. 170 B	39.2	51.7	37.5	52.5	45.2
927	Odessa	40.0	38.3	45.0	49.2	43.1
1375	Success	37.5	47.5	40.8	45.0	42.7
936	Trebi	25.8	51.7	45.0	45.8	42.1
	Hero	37.1	53.3	32.9	45.0	42.1
1176	Meloy	31.7	55.0	37.5	43.3	41.9
	Coast Sel. 276 B	36.7		45.8	43.3	41.9
2299	Himalaya	39.2	46.7	33.3	44.2	40.9
	Meloy Sel. 3	33.3	40.0	38.3	47.5	39.8
531	Hannchen	25.0	45.8	33.3	40.8	36.2
	Cape Coast Hybrid	27.5	35.8	37.5	35.8	34.2

Acre yields, in bushels, of oat varieties grown at Moro, Ore., in 1925, in quadruplicate 1/40 acre plats

C. I. No.	Variety	Acre yields, bushels Series 1	2	3	4	Average
635	Siberian	50.0	61.3	65.0	72.5	62.2
787	Richland	47.5	57.5	58.8	68.1	58.0
1834	Idamine	41.3	58.8	58.8	72.5	57.9
2053	Markton	55.6	51.3	66.3	52.5	56.4
459	Kherson	40.0	56.3	63.8	65.0	56.3
134-1	Swedish Select	48.8	55.0	60.6	55.6	55.0
165-1	Sixty Day 165-1	66.3	51.3	60.0	41.3	54.7
1950	Three Grain	43.8	55.0	61.3	55.0	53.8
1951	Western Wonder	33.8	51.3	51.3	62.5	49.8
	Liberty Hulless		30.6	31.3		31.0

Yields, in bushels per acre, of spring wheat varieties grown at Moro, Ore., in 1925, in quadruplicate 1/40 acre plats.

C. I. No.	Variety	Acre yields, bushels, Series 1	2	3	4	Ave.
4728	Sunset	27.3	30.7	28.7	26.0	28.2
4981	White Federation	26.0	32.7	22.0	28.7	27.4
4984	Major	22.0	22.7	26.0	29.3	25.0
4734	Federation	26.0	25.3	20.0	26.7	24.5
6220	Boadicea	22.7	26.0	21.3	24.0	23.5
4733	Hard Federation	22.0	25.3	22.7	23.2	23.3
6221	Onas	20.0	28.0	17.0	27.3	23.1
6255	Red Bobs	18.0	24.7	24.0	25.0	22.9
2826-1	Bobs	18.0	23.3	24.7	22.0	22.0
4169	Firbank	19.3	21.3	22.7	22.7	21.5
4982	Currawa	20.0	22.0	20.0	22.7	21.2
4166	Bunyip	20.0	23.3	16.7	23.3	20.8
4158	Marquis	17.3	24.0	18.7	23.3	20.8
6607	Quality	20.0	26.0	18.0	18.7	20.7
4067	Pacific Bluestem	17.3	20.0	18.0	24.0	19.8
4066	Little Club	17.3	18.0	20.7	20.0	19.0
1697	Baart	16.7	22.0	18.0	18.0	18.7
6794	Redsask	14.0	21.3	18.7	19.3	18.3
	Hard Federation Sel. No. 57	16.7				
	do 64	16.7				
	do 66	20.3				
	do 71	22.7				

CALIFORNIA

Biggs Rice Field Station, Biggs (C. F. Dunshee)

University Farm, Davis (V. H. Florell)

Agricultural Experiment Station, Berkeley (F. N. Briggs)

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OCT 2 1925
BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 23

September 20, 1925
Personnel (Sept. 11-20) and Field Station (Sept. 1-15) Issue

PERSONNEL ITEMS

John H. Craigie, agent in barberry eradication with headquarters at St. Paul, Minn., resigned September 12 to accept the position of pathologist with the Canadian Agricultural Department. James M. Wallace has been appointed to succeed Mr. Craigie.

Donald D. Hill has been appointed agent, effective September 16, to fill the vacancy caused by the resignation, September 15, of Prof. John H. Parker who is on a year's leave of absence. Mr. Hill will supervise and handle nursery work in connection with cereal breeding investigations and experiments being conducted at Manhattan, Kans., in cooperation with the Kansas Agricultural Experiment Station.

Dr. A. G. Johnson, senior pathologist in charge of cereal disease investigations, left Washington September 20 for points in Indiana, Illinois, Wisconsin, North Dakota, South Dakota, and Minnesota to confer with officials of State agricultural experiment stations regarding cooperative cereal disease experiments.

Jenkin W. Jones, associate agronomist in charge of the rice experiments at the Biggs Rice Field Station, Biggs, Calif., who sailed on September 1 from San Francisco for the Orient in search of early-maturing varieties of rice, wrote just before arriving at Honolulu that he expected to reach Yokohama on September 17 and would go direct to Tokyo to plan a definite itinerary. Mr. Jones' mail headquarters will be in care of the American Consul General at Tokyo.

M. A. McCall, agronomist in charge of cereal agronomy investigations, who left Washington September 9, wrote on the 16th of his inspection, with John H. Martin, of the grain-sorghum project at the Woodward Field Station on the 12th, which was Field Day at the Station. Mr. McCall was much pleased with the appearance of the grain-sorghum experiments under Mr. Sieglinger's care, and noted many complimentary comments by the various visitors.

On the 14th Mr. McCall and Mr. Martin were taken by Supt. E. F. Chilcott to the Lawton (Okla.) Field Station. Heavy rains the day before had broken a long drought. The roads were in bad condition, and it was difficult to see much of the surrounding country because of clouds and mist. However, the northward and westward extension of cotton culture was the most outstanding feature. Cotton growing has been more or less limited on the north by the Canadian River but is pushing even farther north. Some fine looking cotton is also being grown at the Woodward Field Station.

All crops showed the effect of drought. At Woodward there was little evidence of chinch-bug injury, but at Lawton and westward the chinch-bug injury was severe. On the Lawton Station the grain sorghums had been practically destroyed. Everything has been done to combat the pests, but all attempts have proved futile because of the fact that migration is not the usual crawling passage from small-grain stubble to the intertilled row crop after small-grain harvest but is by flight early in the season, apparently in large part from overwintering quarters. Barrier and poison baits are therefore entirely inadequate. There are differences in varietal susceptibility, but whether or not these would persist in case of heavy infestation is doubtful.

From Lawton Messrs. McCall and Martin proceeded by train to Chillicothe, Tex., where they were shown over the Substation by the superintendent. In this part of the country the sorghums, even more than cotton, showed the effects of prolonged drought. There was much less chinch-bug injury, however, than at Lawton. In the vicinity of Chillicothe cotton [illegible] is becoming the important crop, grain sorghums being grown only for feed on the farms.

Mr. McCall left Chillicothe for College Station, Tex., on his way to Crowley, La., while Mr. Martin proceeded to Lubbock, Spur, and Big Springs, Tex. Later they are to meet at El Paso, Tex.

K. S. Quisenberry, associate agronomist in western wheat investigations, returned to Washington September 5 after assisting in harvesting and threshing the winter-hardiness wheat breeding nurseries at Dickinson, N. Dak., and Moccasin, Mont.

Dr. L. J. Stadler, who has served as agent in the cooperative wheat improvement experiments at the Missouri Agricultural Experiment Station for several years, resigned August 31. He is taking a year's leave of absence from his duties at the Station and College. Charles A. Helm, associate professor of field crops at the University of Missouri and assistant in the cooperative experiments, has been appointed agent to succeed Doctor Stadler, effective September 1.

V. F. Tapke, associate pathologist in smut investigations, returned to Washington September 14 from Cornell University, where he has been completing study looking toward his doctorate degree. Mr. Tapke expects to return to Ithaca the latter part of December to take the final oral examination in satisfaction of the final requirements of the Ph.D. degree.

Noel F. Thompson, who was formerly in charge of chemical investigations of methods of eradicating common barberries, has been transferred from Madison, Wis., to Minneapolis, Minn., where he will cooperate with the Conferenc for the Prevention of Grain Rust in educational activities being carried by this Office and the Conference.

VISITORS

Raymond Fogelman, formerly assistant pathologist of this Office in connection with stem-rust investigations, and now operating a silk factory in New Jersey, called at the Office September 19.

MANUSCRIPTS AND PUBLICATIONS

58 An article, entitled "An Unused Southern Wild Plant," by Charles E. Chambliss, was approved September 1 for publication in the Rice Journal of New Orleans.

59 An article, entitled "Polyploidy in Zea mays L.," by L. F. Randolph and B. McClintock, was approved September 11 for publication in Science.

60 A manuscript, entitled "Segregation and Correlated Inheritance in Marquis and Hard Federation Crosses with Factors for Yield and Quality of Spring Wheat in Montana," by J. Allen Clark and John R. Hooker, was submitted September 19 for publication as a Department Bulletin.

61 A manuscript, entitled "Development in Immature Barley Kernels Removed from the Plant," by Harry V. Harlan and Merritt N. Pope, was submitted September 19 for publication in the Department Bulletin series.

Page proof of article, entitled "Improved Oat Varieties for the Corn Belt," by L. C. Burnett, T. R. Stanton, and C. W. Warburton, was read September 11.

Page proof of article, entitled "Experiments in Rice Production in Southwestern Louisiana," by C. E. Chambliss and J. M. Jenkins, was read September 2; second page proof, September 11.

The article, entitled "Heritable Characters of Maize. XXII. Purple Plumules," by Merle T. Jenkins, appears in the Journal of Heredity, vol. 16, no. 8, p. 307-310, figs. 12-13. August, 1925.

The article, entitled "A Mosaic on Winter Wheat and Winter Rye," by H. H. McKinney, appears in Phytopathology, v. 15, no. 8, p. 495-496. August, 1925.

The article, entitled "Preliminary Environmental Studies on the Take-All Disease of Wheat Caused by Ophiobolus graminis Sacc.," by H. H. McKinney and R. J. Davis, appears in Phytopathology, vol. 15, no. 8, p. 494-495. August, 1925.

The article, entitled "The Comparative Value of Kota and Marquis Wheats for Milling and Bread Making," by J. Allen Clark and J. H. Shollenberger, appears in The Northwestern Miller, vol. 143, no. 11, p. 1102-1104. September 9, 1925.

IMPORTANT

Washington, D. C., September 18, 1925.

B. P. I. Memo. 163.

MEMORANDUM FOR HEADS OF OFFICES.

Gentlemen:

We have been requested by Mr. Jump to compile regularly information regarding improvements in organization, economies effected or better business methods adopted, for transmittal to the Director of the Budget. When this data is collected but once a year, many things have been forgotten or are overlooked. It has therefore been suggested that this data be compiled quite frequently. It is our plan to assemble the data quarterly and accordingly, we shall appreciate it if you will let us have a statement of the character outlined above, at an early date covering your office.

This request should be circulated among our field men and they be given an opportunity to present details of any improvements or economies which they have been able to accomplish since the last report.

Very sincerely,

WM. A. TAYLOR

Chief of Bureau.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor)

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig) (September 14)

The wheat test for this year was very good. Forward led most of the other sorts in yield but was outyielded by two bearded varieties, Fulcaster, by 1.2 bushels, and Gypsy, a selection from Ohio, by 8.2 bushels. The Gypsy has a very weak straw, however, and usually lodges badly; the fact that it is a bearded variety makes it undesirable for New York State, as the farmers in general prefer a beardless variety.

The following table gives the yields for 1925, with the gain or loss over the Forward check, of the principal varieties grown in New York State in competition with Forward. It is impossible in this brief report to give the comparison of the several hundred sorts under test.

Variety	Yield per acre (bu.)	Gain or loss over check (bu.)
Honor	46.0	.3
Red Rock	42.8	-2.1
Junior No. 6	42.2	-3.0
Dawson Golden Chaff	39.6	-7.5
Gold Coin	36.8	-7.5
Penn No. 44	32.6	-12.5
O. A. C. No. 104	30.5	-14.8

In the following table are given the yields and gain or loss over the check, with the estimated survival in per cent, of the winter hardiness test, which was sown this year with the Forward as a check every fifth row.

RESULT OF WINTER HARDINESS TEST, 1925

Variety	C. I. No.	Estimated survival (Per cent)	Yield per acre (bu.)	Gain or loss over check (bu.)
Turkey Sel.	6152	86.7	43.2	+ 4.4
Kanred	5146	83.3	38.0	+ .1
Turkey Sel. 1571 C	7364	85.0	35.3	- .6
Turkey Sel.	6250	85.0	34.8	- 2.1
Turkey	3955	86.7	36.8	- 3.0
"Kanmarq"	6937	81.7	41.1	- 3.0

Continued

Variety	C. I. No.	Estimated survival (Per cent)	Yield per acre (bu.)	Gain or loss over check (bu.)
Beloglina	1543	83.3	32.8	- 3.1
Blackhull	6251	86.7	34.6	- 4.3
"Tenmarq"	6936	76.7	38.1	- 4.8
Turkey	6249	81.7	32.8	- 5.0
Montana No. 36	5549	83.3	34.3	- 5.5
Beloglina	1667	80.0	30.7	- 6.2
Malakof Sel.	6680	88.3	37.2	- 6.2
Karmont	6700	81.7	32.4	- 7.4
Kharkof	1442	81.7	31.7	- 8.1
Marquis x Kanred (Ks. 449)	.	78.3	37.7	- 9.2
Minhardi	5149	86.7	31.3	-10.2
Minard	6690	81.7	36.0	-11.0
Padui	6153	88.3	29.4	-11.3
Iobred	6934	85.0	35.3	-12.6
Minturki	6155	75.0	28.9	-13.3
Newton x Turkey	6935	81.7	31.0	-15.1
Sherman	4430	73.3	26.7	-16.4
P1068 x Preston (Ks. 446)		75.0	31.6	-16.7
Odessa	6151	86.7	24.8	-18.2
Marquis x Kanred (Ks. 441)		75.0	25.3	-20.2
Kharkof Sel.	6938	88.3	28.0	-20.8
Buffum No. 17	3330	88.3	22.7	-20.9
Forward (average of all checks)		76.9	42.3	

The oat test this year was very promising until about three weeks befor harvesting. At that time the oats went down in a storm so badly that it prevented their filling out well, and the test will not be so good as expected.

The threshing, calculation of yields, and selection of material for fall planting have been completed, and everything is in readiness for sowing about September 15. There will be over 5,000 rows in the rod-row series this year, including 920 sorts or strains, mostly hybrid selections, tested as follows:

Test	Number of sorts tested	Number of times tested
Advanced test	10	30
10 row test	104	10
5 " "	128	5
2 " "	504	2
Dr. Leighty's test	119	3
Winter hardiness test	30	3
Smut test	7	4
Rye test	18	3
Total	920	

J. W. Taylor, in charge of the cereal experiments of the Office of Cereal Investigations, at Arlington Farm, Va., inspected the cereal investigations here August 13 and 14. Dr. C. E. Leighty, of the same Office, was a visitor in the week of September 1.

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg)

MISSOURI

Agricultural Experiment Station, Columbia (C. A. Helm)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz)

Iowa State College, Ames (Barberry Eradication, M. A. Smith)

ILLINOIS

Funk Bros. Seed Co., Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran)

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer)

OHIO

College of Agriculture,Ohio State University, Columbus (Barberry Eradication, J. W. Baringer)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (September 15)

Dry weather continued until September 10. Since then there has been about an inch of rain in three showers. The drought had affected the sorghums, and some varieties had dried ripe. Those in the later date-of-seeding experiments and in the varietal experiments probably will fill well as the result of the rain.

Three of the earlier varieties, Freed sorgo, Pink kafir, and Blackhull kaoliang, were harvested on the 10th. Most of the broomcorn has been harvested; the two later date-of-seeding experiments and some Standard varieties remain to be harvested. The rain will have no effect on broomcorn yields but may cause the brush to become discolored.

Saturday, September 12, was Field Day at the Station. The weather was ideal, and there was an estimated attendance of 400 to 1,000; the writer believes it was between 500 and 600. County agents from the surrounding counties brought a number of their farmers. The principal speakers were Mr. Carl Williams, editor of the Oklahoma Farmer-Stockman, and President Bradford Knapp, of the Oklahoma A. & M. College. Other prominent visitors were Dean Dowell and Professors Doane, Baer, and Cochran, of the Oklahoma A. & M. College, R. E. Karper, of the Texas Agricultural Experiment Station, and Mr. Tinsley, Agricultural Agent of the Santa Fe Railroad, with headquarters at Amarillo, Tex.

J. H. Martin and A. F. Swanson arrived by auto from the west on September 11, and M. A. McCall came on the morning of the 12th. These members of the Office of Cereal Investigations were present for Field Day, but they were particularly interested in the grain-sorghum project, which they thoroughly inspected.

The one disappointing feature of Field Day is that so little individual attention can be devoted to each of the many interesting and interested visitors who come at one time.

Maximum temperature for the first half of September, 99 degrees on the 6th; minimum, 56 degrees on the 12th; precipitation, 0.95 inch in three showers of 0.53, 0.15, and 0.27 on the 10th, 13th, and 14th, respectively.

KANSAS

Agricultural Experiment Station, Manhattan (D. D. Hill)

Hays Branch Experiment Station, Hays (A. F. Swanson) (September 16)

The weather of the first 15 days of September were somewhat dry, but the lack of rainfall has been helpful in bringing the sorghum crop to maturity. The sorghums are now ripening rapidly, with promise of satisfactory yields in the vicinity of Hays. The early maturing varieties on the cereal project have been harvested.

The writer returned on the 14th from an extended trip through the sorghum belt of southern Kansas, eastern New Mexico, and the Panhandle of Texas and Oklahoma. The acreage of sorghum in Kansas appears to be considerably reduced from that of former years; the crop is not up to standard. Excellent crops of sorghums were found in the Panhandle of Texas and Oklahoma, with the milos and kafirs predominating. Little corn is to be found in central Kansas, but some good fields were noted in the sandy soils of the southwestern portion of the State.

Earl G. Clark, of Sedgwick, Kans., originator of Blackhull wheat, is distributing for the first time this year a new selection known as Clark's Super-Hard Blackhull. A number of claims are made for it. In comparison with the original Blackhull, the chief characteristics of the new selection are its hard and vitreous kernels and a darker red color. Ten pounds of seed were obtained for the experimental plats at Hays for seeding this fall.

Because of the abundance of moisture in the last half of July and in August the farmers of central and western Kansas have as a rule prepared good seedbeds for the new wheat crop. Seeding has already begun in some sections. In the vicinity of Hays evidence of the Hessian fly can be found on volunteer wheat. Most of the farmers have made an effort to destroy volunteer wheat this year.

COLORADO

Akron Field Station, Akron

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) (September 16)

On September 13, 0.84 inch of precipitation was recorded. This relieved the long dry spell and put the soil in good condition for wheat planting.

Nursery and variety plantings will begin in a few days.

On most farms, the corn yield will be very light. Many fields are not worth picking.

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) [September 12]

Second survey for the common barberry in Roberts County proved to be valuable and interesting. Eighty-two bushes were found on ten different properties. It was impossible to complete the entire county because of an outbreak of hog cholera in the two northeast townships. Although only an occasional farm was quarantined, it was thought advisable to leave this territory until later in the fall to avoid any unnecessary criticism and to insure a more effecient survey.

Roberts County was the second in the State to be covered by the original farm-to-farm survey. This was in 1920. It is in the heart of the spring-wheat district in South Dakota. Practically every barberry bush found this year had been infected with stem rust, but because of unfavorable environment no distinct spreads of stem rust from barberries were observed. However, some valuable information was obtained concerning the spread of rust from barberries some years ago. A property owner of the SW¼ of Sec. 34, Township 129, R 51, said that he had fifty barberries in 1906 but that he had destroyed them. He stated that in 1905 he heard H. L. Bolley, Dean of Botany, North Dakota Agricultural College, lecture about the common barberry and its part in spreading stem rust. He had barberries on his farm at that time but decided to give them a fair trial the following year. He stated that in 1906 there was little rust in the entire county, but that his wheat next to the barberries was not worth cutting. A distinct spread of stem rust from barberries could be noticed for 70 rods. This was sufficient proof for him, and the bushes were destroyed. This property owner is an ardent supporter of the barberry eradication campaign.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayone)

Dickinson Substation, Dickinson (R. W. Smith) (September 15)

With the exception of a few light showers the weather this month has been favorable for threshing operations, which are well along in this part of the State. The average yield of wheat in Stark county is perhaps 10 bushels per acre. The quality is uniformly good.

Threshing at the Substation is practically completed, with the exception of a portion of the cereal nursery and a few increase plats.

On September 12 the early flint varieties of corn were harvested and the yield from about 10 acres of Northwestern Dent was put in the pit silo. The corn crop is rather light as the result of the dry summer, but is ripening fairly well.

A light frost on September 12 failed to do any material damage to crops at the Substation, although the temperature dropped to 27 degrees.

The soil remains too dry for germination of winter wheat and rye sown some time ago. It also is too dry to do a good job of fall plowing.

Official visitors at the Substation this month included Director P. F. Trowbridge, of the State Agricultural Experiment Station, Hon. J. A. Kitchen, State Commissioner of Agriculture and Labor, and Frederick D. Richey, of the Office of Cereal Investigations.

Superintendent Leroy Moomaw left on September 10 for a trip among the various field stations in the States south of this State.

Northern Great Plains Field Station, Mandan (Flax Investigations, J. C. Brinsmade, Jr. (September 17)

The final seeding of the flax date-of-seeding and tillage experiment was harvested September 12. The plats repeatedly disked before seeding were fairly free from thistles and easy to harvest. The plowed plats were harvested with the binder with difficulty on account of the thick mat of thistles.

The western ends of the flax varietal plats on plowed land were too weedy to harvest without great difficulty, and would have been still more difficult to thresh. The eastern half of the plats in replications 1 and 2, relatively free from Russian thistles, were harvested with the binder September 15. The remainder was mowed and discarded.

The harvesting of the flax nursery plantings was completed today.

In the first half of September there was much cloudy weather, with occasional showers. Maximum temperature for the period was 99 degrees, September 3; minimum 35 degrees, September 10; precipitation, 0.53 inch.

Northern Great Plains Field Station, Mandan (Wheat Investigations, E. R. Ausemus and Ralph Williams) (September 17)

The following results were obtained from that part of the wheat nursery grown in nine-rod rows. The nursery was seeded April 15 and emerged April 25.

Dates of heading and ripening, height, leaf and stem-rust infection and average yield of varieties and hybrids grown in three rod-rows replicated three times at the Northern Great Plains Field Station, Mandan, N. Dak. 1925.

Variety or Hybrid	Hybrid No.	C.I. No.	Headed	Ripe	Height inches	Rust Leaf	Rust Stem	A.Yld. Bu.
Kanred x Marquis	II-17-40	8013	6/22	7/28	41	2	15	36.1
Ceres (Kota x Marquis)	Ns1653	6900	6/21	7/30	42	5R	4	35.0
Kanred x Marquis	II-13-44	8019	6/22	7/31	42	t	18	34.6
Kota x Marquis	Ns1656.84	8004	6/21	7/29	42	15	4	32.4
" "	1656.97	8005	6/21	7/28	44	5	2	30.9
Kanred x Marquis	1718B9-11	7371	6/22	7/29	41	t	12	29.8
Kota x Marquis	1656.4	8001	6/22	7/27	45	t	3	29.4
" "	1656.7	8002	6/22	7/27	43	t	2	29.4
" "	1656.65	8003	6/22	7/29	43	10	2	29.3
" "	1656.124	8007	6/21	7/29	45	8	2	28.9
" "	II-19-11	8009	6/21	7/29	42	5	1	28.4
Kanred x Marquis	II-17-37	8017	6/22	7/29	42	t-40	12	28.0
" "	II-18-8	7374	6/22	7/29	43	25	10	27.9
Marquis x Iumillo	II-15-44	6887	6/18	7/30	35	2	5	26.9
Marquis*		3641	6/22	7/31	41	2	21	26.5
Quality		6607	6/13	7/27	37	50	35	26.5
Kota x Hard Federation	A1-16-5		6/17	7/27	40	50	3	26.3
Kanred x Marquis	1718B8-11	7370	6/22	7/29	42	8	5	26.0
Kota*		5878	6/24	7/29	45	50	1	25.2
Kota (natural cross)	II-18-20	8015	6/23	7/31	47	50	5	25.1
Kota x Marquis	Ns1655	6898	6/20	7/28	42	t	t	24.9
" "	II-19-9	8003	6/22	7/30	45	30	2	24.3
Kota x Hard Federation	A1-16-1-3		6/20	7/28	37	50	3	23.9
" "	A1-16-1-5		6/18	7/29	37	40	3	23.2
Kota (natural cross)	II-18-21	8016	6/24	7/29	46	75	2	22.4
" "	II-19-1	7376	6/24	7/31	46	75	4	22.3
Kanred x Marquis	1718B9-14	7372	6/22	7/29	42	30	28	20.7
Kota x Ruby	II-19-29	8014	6/25	7/28	47	50	3	20.3
" "	II-19-18	8010	6/21	7/27	44	25	3	19.7
Hard Federation		4733	6/14	8/1	30	75	80	18.4
Kota x Ruby	II-19-19	8011	6/22	7/26	45	25	2	17.3

*Average of 13 rows

The Kanred x Marquis, 1718B8-11, which ranked 13th in this nursery was badly damaged from drought. As it had been a high yielding strain in other experiments it was increased, together with Ceres, on plats 63.5'x 125' each, just north of the nursery. The results obtained from these increase plats are as follows:

Hybrid	Number	Headed	Ripe	Height	Stem Rust	Yield (bus.)	Test weight
Kanred x Marquis	1718B8-11	6/17	8/2	43	25	42.5	57
Ceres (Kota x Marquis)	Ns.1658	6/15	7/30	45	5	36.9	60

MONTANA

Judith Basin Substation, Moccasin (R. W. May)

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens)

CALIFORNIA

Biggs Rice Field Station, Biggs (C. F. Dunshee)

University Farm, Davis (V. H. Florell)

Agricultural Experiment Station, Berkeley (F. N. Briggs)

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OCT 12 1925
BUREAU OF
PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 24

September 30, 1925
Personnel (Sept. 21-30) and Project Issue

PERSONNEL ITEMS

Miss Charlotte E. Blake, clerk in the office of the State leader of barberry eradication in North Dakota, resigned at the termination of September 30.

Miss Edna K. Brueggeman was appointed September 25 to assist in the office of the State leader of barberry eradication in Nebraska, with headquarters at Lincoln. Miss Brueggeman succeeds Mrs. Burnetta R. Walroth, who resigned at the termination of September 24.

M. A. McCall, agronomist in charge of cereal agronomy investigations, wrote on September 22, en route to El Paso, Tex., that all of eastern Texas had been affected by severe drought. Rains of the past two weeks had benefited fall vegetation but were too late to improve existing conditions. Since his last letter Mr. McCall had conferred with officials of the Texas Agricultural Experiment Station at College Station, Tex., and with Mr. Geo. T. Ratliffe, superintendent of the San Antonio Field Station, at San Antonio. He also spent three days in inspecting the operations of the Rice Experiment Station at Crowley, La.

F. D. Richey, agronomist in charge of corn investigations, returned to Washington September 21.

R. W. Smith, associate agronomist in charge of the cooperative cereal experiments at the Dickinson Substation, has been authorized to spend the winter months at the North Dakota Agricultural College, Fargo, to carry on his research, to write the annual report of the experiments at Dickinson, and to use the library facilities of the College.

Dr. W. H. Tisdale, pathologist in charge of smut investigations, left Washington September 28 for Yonkers, N. Y., where he will be stationed for several months at the Boyce-Thompson Institute to engage in micro-chemical and physiological studies of the corn-smut problem.

VISITORS

President F. D. Farrell, of the Kansas State Agricultural College, was a visitor in the Office on September 26.

MANUSCRIPTS AND PUBLICATIONS

Page proof of Farmers' Bulletin 1464, entitled "Barley: Culture, Uses and Varieties," by H. V. Harlan, was read September 28.

Second page proof of Department Bulletin 1334, entitled "Tests of Barley Varieties in America," by H. V. Harlan, Mary L. Martini, and M. N. Pope, was read September 22.

Department Bulletin 1361, entitled "A Mosaic Disease of Winter Wheat and Winter Rye," by Harold H. McKinney, dated September, 1925, has been received from the Government Printing Office.

TRANSLATIONS

Anonymous. Bekämpfung des Gelbrostbefalls durch Kalisalze. (Combating yellow-rust by means of potassium salts.) Ernähr. Pflanze 20: 75-76. 1924.

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The above list of translations of articles by foreign writers on cereal diseases supplements the lists found in the Cereal Courier of earlier dates:

Vol. 13: 12-15, 52, 69 and 225-226
Vol. 14: 38, 39 and 99-100
Vol. 15: 11-13 and 46-47
Vol. 16: 16-18 and 127
Vol. 17: 62-63.

Copies of the translations may be consulted in the library of the Bureau of Plant Industry.

PROJECT REPORTS

SEED FLAX INVESTIGATIONS

(A. C. Dillman, Associate Agronomist in Charge, in cooperation with Geo. T. Ratliffe, Superintendent, San Antonio (Texas) Field Station.)

Experiments with Seed Flax as a Fall-Sown Crop at the San Antonio (Texas) Field Station

Experiments with seed flax as a fall-sown crop at the San Antonio Field Station, San Antonio, Tex., were first begun in 1914 in cooperation with the Office of Western Irrigation Agriculture. Preliminary experiments indicated the possibility of growing seed flax as a winter crop in that region, and more extensive experiments were outlined to determine the most successful date of seeding, the most winter hardy varieties and the best cultural methods. The earlier results are given in the annual reports of the San Antonio Field Station.

The chief obstacles to successful flax cropping in this region are drought and freezing temperatures. Dry conditions of the soil may prevent seeding at the proper season or interfere with the full development of the crop. Winter temperatures of 20 to 25 degrees F. frequently occur, injuring the plants and thinning the stands.

The experiments indicate that the best average date of seeding is from the middle of November to the latter part of December, depending upon the proper condition of moisture in the soil, which is important to insure quick and even germination of the seed. Drought and other adverse conditions have prevented carrying out a date-of-seeding experiment every year; but yields obtained in 1919, 1923, and 1924 are reported below.

Yields of flax, Damont, C. I. No. 3, in date-of-seeding experiment at the San Antonio (Texas) Field Station in 1923 and 1924

Date of seeding	Spring survival (per cent)	Date of ripening	Yield (Bu. per acre)
	Crop of 1919		
Nov. 18, 1918	---	May 6	19.0
Dec. 2, 1918	---	---	18.5
March 1, 1919	---	---	12.3
	Crop of 1923		
Nov. 11, 1922	82	May 23	10.1
Dec. 21, 1922	92	do	11.4
Jan. 20, 1923	98	do	9.8
March 10, 1923	100	June 4	7.3

Continued

Date of seeding	Spring survival (Per cent)	Date of ripening	Yield (Bu. per acre)
	Crop of 1924		
Nov. 23, 1923	25	May 28	7.7
Dec. 29, 1923	95	May 31	18.0
Jan. 26, 1924	90	June 2	18.9
Feb. 28, 1924	100	June 23	12.5
March 21, 1924	95	June 27	6.9

Varietal experiments indicate that there are considerable differences in the winter hardiness of varieties and their ability to produce profitable yields under adverse conditions. Yields of several varieties grown in replicated field plats are shown in the following table. No plantings were made in 1921.

Yields of flax varieties grown as winter crops at the San Antonio (Texas) Field Station in the period from 1919 to 1925, inclusive

C.I.No.	Variety	1919	1920	1922	1923	1924	1925	Average 6-yrs.	Average 3-yr 1922-
114	N. D. R. No. 114	9.0	3.6	6.5	11.8	15.3	1.9	8.0	11.2
12	Primost	---	---	3.4	13.5	12.2	---	---	9.7
8	N. D. R. No. 52 a/	---	---	6.1	9.6	10.9	1.8	---	8.9
3	Damont b/	12.4	4.5	5.3	10.0	12.9	3.8	8.1	9.4
244	Linota	---	---	---	---	---	1.7	---	---
280	Long No. 79	---	---	---	---	16.3	3.8	---	---
44	La Platta	---	---	---	---	---	4.0	---	---
107	Morteros	---	---	---	---	---	3.5	---	---
109	Rosquin	---	---	---	---	---	3.6	---	---
314	Morye	---	---	---	---	---	2.9	---	---
316	Rosario	---	---	---	---	---	3.1	---	---
	Average	10.7	4.0	5.3	11.2	13.5	3.0	8.0	9.8

a/ C. I. No. 275 was grown in 1925

b/ The yield of Reserve, C. I. 19, another strain of N. D. No. 155, was substituted in 1925, when Damont was not grown

The crop of 1925 suffered both from severe winter freezing and extreme drought. The land used for the varietal experiments was sown to small grain in 1923-24. It was plowed in July and kept free from weeds by necessary cultivation with a disk. No rain of consequence fell after the land was plowed except one rain of 1.98 inches in September and another of 2.36 inches on December 1 and 2. The flax was sown on December 9. Mr. Ratliffe writes: "None of the varieties produced economical yields this season. The fact,

however, that flax was the only winter crop grown by us this year which so much as returned the seed sown is worthy of note.

"Slow germination and early growth resulted from low temperatures following planting. Practically all above-ground growth was killed during a severe drop in the temperature which lasted from December 18 to 20, inclusive, with a minimum of 22 degrees F. the night of the 19th. The plats showing the best stands later in the season were those on which very little emergence had taken place up to this time. Subsequent equally low temperatures throughout January and February prevented rapid growth of the plants, and by the time the weather became warmer the available moisture was so low that the flax plants did not acquire much height."

In 1923 and 1924, 19 varieties and selections were grown in cultivated rows, providing more favorable conditions of soil moisture. The yields which averaged somewhat higher than the yields in close drilled plats, are shown in the following table.

Yields in bushels per acre of flax varieties grown in nursery rows at the San Antonio Field Station in 1923 and 1924

C. I. No.	Variety	1923a/ (Bushels per acre)	1924b/ (Bushels per acre)	Average (Bu. per acre)
3	Damont (12 check rows)	13.7	9.2	11.5
19	Reserve	19.6	15.1	17.3
187	Sel. 19-5	25.8	11.9	18.8
12	Primost	9.1	7.9 c/	8.5
27	Nova Rossick	19.6	14.5	17.0
149	Sel. 27-5	16.4	20.2	18.3
261	Sel. 27-13	19.6	12.7	16.1
260	Sel. 4-1	26.7	17.4	22.0
179	Winona	15.1	16.0 c/	15.5
180	Red Wing	12.3	10.8	11.6
182	Cantania	21.3	14.2	17.7
44	La Platta	24.2	24.7	24.4
107	Morteros	29.2	24.3 c/	26.7
109	Rosquin	31.8	24.6	28.2
25	Williston Golden	21.5	17.5	19.5
263	Sel. of C. I. No. 30	4.8	7.1	6.0
262	Sel. of C. I. No. 30	5.1	2.3 c/	3.7
266	Sel. of C. I. 34-32	17.1	13.9 c/	15.5
267	Sel. of C. I. 34-34	25.2	18.8	22.0

a/ Average of triplicate rows 35 feet long, 1 foot apart
b/ Average of duplicate rows 35 feet long, 16 inches apart
c/ One row only

The varieties of the large-seeded Argentine types,- La Platta, Morteros, and Rosquin, produced the highest yields, at the rate of 24.4 to 28.2 bushels per acre. They give promise of being well adapted to cultivation as a winter crop at San Antonio. These and three other Argentine types,- Long No. 79, Morye, and Rosario, were included in the plat tests in 1925, as shown in the table giving plat yields.

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Bureau of Plant Industry, U. S. Dept. of Agriculture
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Vol. 17 No. 25

October 10, 1925
Personnel (Oct. 1-10) and Field Station (Sept. 16-30) Issue

PERSONNEL ITEMS

Dr. A. G. Johnson, senior pathologist in charge of cereal disease investigations, returned to Washington October 9 from a very satisfactory trip in Indiana, Illinois, Wisconsin, North Dakota, and South Dakota. The cooperative cereal disease investigations that are being conducted in the different States are progressing in a satisfactory manner. In Indiana and Illinois corn harvest is in full swing. At Madison, Wis., the first sowings in the wheat scab experiments are well up. At Fargo, N. Dak., the flax from the experimental plats has been harvested and will soon be ready for threshing.

A number of manuscripts on various phases of the cooperative investigations are in process of preparation.

Adolph Klies, was appointed laborer, effective October 12, to assist with experiments in connection with the cereal disease investigations that are being conducted at Agricultural College, N. Dak., under the direction of W. E. Brentzel.

C. H. Kyle, agronomist in corn investigations, left Washington October 10 for Florence, S. C., where he will harvest experimental plats of corn and take notes on seed ears. Mr. Kyle will be away about ten days.

Dr. H. H. Love, of the department of plant breeding at Cornell University, writes from Nanking on September 7 that he will leave China the latter part of October on his way to New York, probably stopping en route in Washington.

M. A. McCall, agronomist in charge of cereal agronomy investigations, returned to Washington October 10 from an extended western trip.

Dr. E. R. Schulz, formerly agent in the barberry eradication investigations conducted in cooperation with the Wisconsin State Department of Agriculture, who resigned July 31, 1925, has accepted a position as research chemist with The Patent Cereals Co., Geneva, N. Y.

Dr. L. J. Stadler, formerly agent of this Office in the cooperative wheat improvement experiments at the Missouri Agricultural Experiment Station, is on sabbatical leave and will be at the Bussey Institution, Harvard University, until July 1, 1926.

The appointment of Joe L. Sutherland, unskilled laborer at the Judith Basin Substation, Moccasin, Mont., was terminated October 3.

MANUSCRIPTS AND PUBLICATIONS

A manuscript, entitled "Tatucid or False Wild Forms in Fulghum and Other Oat Varieties," by T. R. Stanton, F. A. Coffman, and G. A. Wiebe, was approved October 6 for publication in the Journal of Heredity.

Page proof of Department Bulletin 1347, entitled "Foot-Rot Diseases of Wheat in America," by Harold H. McKinney, was read October 8.

Department Circular 363, entitled "Improved Oat Varieties for New York and Adjacent States," by H. H. Love, T. R. Stanton, and W. T. Craig, dated August, 1925, was received from the Government Printing Office October 2.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA
State College of Agriculture, Athens (R. R. Childs)

VIRGINIA
Arlington Experiment Farm, Rosslyn (J. W. Taylor)

NEW YORK
Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA
Rice Experiment Station, Crowley (J. Mitchell Jenkins)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg)

MISSOURI
Agricultural Experiment Station, Columbia (C. A. Helm)

TENNESSEE
Agricultural Experiment Station, Knoxville (L. S. Mayer)

IOWA
Agricultural Experiment Station, Ames (M. T. Jenkins)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz)

Iowa State College, Ames (Barberry Eradication, M. A. Smith) (October 1)

The field season closed on September 15. From July 1 to September 15 a complete second survey was made in Audubon, Cass, Harrison, Jones, Emmet, Pottawattamie, Shelby, and Dickinson counties. These counties, with the exception of Jones, were among the first counties completed in the original farm-to-farm survey in 1919 and 1920.

Audubon, Cass, Pottawattamie, Harrison, and Shelby counties are in the extreme western part of the State. In Audubon County, 84 bushes were found on eight rural properties. In Cass County there were 67 bushes on seven properties. In Harrison County, out of a total of 18 properties, 11 had escapes. In this county 111 bushes were found; a new wild area near the Little Sioux River contained a majority of the bushes found. In Pottawattamie County 78 bushes were located on a total of 15 properties.

Emmet and Dickinson counties are in the northwestern part of the State. While the survey in these counties was conducted in all respects like that in the other counties, a situation similar to that in Minnesota was confronted. Farms in this section of the State have many groves and woodlots, each one of which was covered very thoroughly. In Emmet County 60 bushes were found on nine properties, while in Dickinson County, 75 bushes were found on 16 properties.

Jones County is in the eastern part of the State. In this County 531 bushes and 1,832 seedlings were found on 55 properties. More bushes were found in Jones County than in all of the others covered in the second survey this year. Two new areas of escaped barberries were located, and, in addition, by means of the thorough scouting of timberlands near known areas of escapes, a considerable number of bushes not found on the first survey was located.

A regular routine resurvey was made in 24 counties in southeastern Iowa in the field season of 1925.

From the results of the second survey in Iowa this year it is very apparent that too much stress can not be laid on a thorough foot survey of every woodlot and carefully organized scouting in timberlands.

ILLINOIS

Funk Bros. Seed Co., Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (October 5)

One of the best barberry-eradication demonstrations this year was held at the Illinois State Fair September 19 to 26, in cooperation with the Illinois State Department of Agriculture. About 20 leads on common barberry locations were obtained. Hundreds of people made good use of the opportunity to examine the common and Japanese barberry at the demonstration and went away fully satisfied that they could identify the harmful barberry.

The second survey of the northern part of Cook County, one township in Lake County, and the northern part of Vermilion County was completed in September. More than 45,000 bushes have been found and destroyed in these three counties this summer. It has been a slow and difficult task to clear up the escaped area in Lake County.

Considerable progress has been made in plans for the rural school educational campaign. Material will be sent out in October to the rural school teachers in 40 counties. Lists of teachers and their addresses have been obtained from the county superintendents. Each county superintendent has agreed to furnish a form letter endorsing the barberry eradication campaign. This letter will be enclosed with the barberry-study material mailed out from this office.

The original survey of Champaign, Coles, Scott, and Shelby counties was completed in September. More than 327,000 common barberry bushes have been found and destroyed on original survey this year.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) [September 30]

The weather of the last half of September averaged rainy and cloudy. The sorghums will be ripe and ready to harvest before frost this year. All of the broomcorn with the exception of seed material has been harvested; the last plat in the date-of-seeding experiment, seeded July 1, was harvested September 29.

At present seed heads are being selected and plats are being harvested.

On September 28 Professors Griffee and Klages, of the Oklahoma Agricultural College, visited the Field Station and went over the sorghum project as thoroughly as time permitted.

Conditions are favorable for starting winter wheat and barley. Most of the land had been well prepared, and the rains in September were helpful in putting the seed bed in good condition.

Maximum temperature for last half of September, 94 degrees on the 18th; minimum, 51 degrees on the 23rd. The precipitation was 1.46 inches on seven days of the la . half of September, or a total of 2.44 inches for the month. The precipitation recorded for 1925 to the first of October is 12.82 inches, as compared with the 11-year average of 20.26 inches.

KANSAS

Agricultural Experiment Station, Manhattan (D. D. Hill) (October 5)

Extremely high temperatures and dry weather prevailed in eastern Kansas in the early part of September. Cool, cloudy, and wet weather prevailed during the last week and delayed farm operations to some extent. Wheat seeding was just getting under way on October 1.

Seeding of the Station nursery was begun on September 30 and finished October 4. Optimum conditions of soil moisture existed at seeding time. Germination has been prompt, the first seeding emerging on October 4. The nursery this year contains about 3,500 18-foot rows, 1,200 5-foot rows, and 1,100 8-foot rows of spaced plants.

The sorghum varieties and crosses are in good condition as a result of the abundant rainfall of the last two weeks. S. F. Hollar, who is in charge of the sorghum-breeding project in the absence of J. H. Parker, has bagged more than 2,000 heads the past summer. These are being harvested now in preparation for next year's seeding. The sorghum nursery will be ready for harvest about October 12.

H. M. Tysdale, of Saskatchewan, Canada, has been appointed graduate assistant in agronomy. He will be engaged on a special problem on winter hardiness of wheat under the direction of S. C. Salmon, professor of farm crops.

The following were recent visitors at the Station: J. H. Martin and F. D. Richey, of the Office of Cereal Investigations, and H. V. Vinall, and R. A. Oakley, of the Office of Forage-Crop Investigations, in Washington, D. C.

Hays Branch Experiment Station, Hays (A. F. Swanson)

COLORADO

Akron Field Station, Akron

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Ma[illegible]ue)

Dickinson Substation, Dickinson (R. W. Smith) (October 1)

On a separate sheet I am enclosing the yields obtained this year from the replicated plats of oats, barley, flax, and proso at the Dickinson Substation. The wheat yields were reported some time ago. The corn yields will be reported later after sufficient time has elapsed for samples of each variety to become air dried.

With oats and barley the early varieties yielded comparatively better than usual owing, probably to the fact that the early varieties were more nearly mature when injury from heat and drought began to be noticeable. Flax yields were reduced by the heat. The prosos were thin in stand and were injured somewhat by Russian Thistles as well as by the drought.

Yields of oat varieties grown at the Dickinson Substation in quadruplicate plats in 1925.

Variety	C. I. No.	Yield (Bu. per acre)
Midseason white		
Lincoln	738	31.2
Big Four	658	30.6
Silvermine	659	28.2
Swedish Select	134	26.7
Victory	560	26.3
Avalanche	1440	26.1
Iogren	2024	25.5
Siberian	741	24.5
Banner Selection	1997	23.8
Early Mountain No. 8	2036	17.0
Corriente	2143	12.2**
Midseason yellow		
Golden Rain	493	25.5
Markton	2053	36.3
Late side oats		
White Russian	551	16.3
Liberty Hull-less	845	23.5
Early		
Richland	787	41.2
Kherson	459	38.8
Gopher	2027	36.9
Sixty-Day	165	36.7

Continued

Variety	C. I. No.	Yield (Bu. per acre)
Iowar	847	33.4
Nebraska No. 21	841	35.1
Yaroslav Emmer	1526	22.1

Yields of barley varieties grown at the Dickinson Substation in quadruplicated plats in 1925

Variety	C. I. No.	Yield (Bu. per acre)
2-rowed hulled		
Scholey	962	26.9
White Smyrna Sel.	2169	26.1***
Hanna	203	24.1
Princess	529	23.1
White Smyrna	658	22.5***
Steigum	907	21.5
Svanhals	187	19.4***
Hoil Hanna No. 1	681	19.4*
Hannchen	531	16.9***
6-rowed hulled		
White Gatami	920	31.0
Odessa	182	29.3***
Lion	923	29.0*
Gatami	575	28.0***
Manchuria	863	26.5***
Flynn	1311	20.5***
Chile Common	863	19.2***
Club Manicut	932	19.1***
Oderbrucker	---	18.4*
Hooded hulled		
Wing Pedigree	1177	20.2
Hooded hull-less		
Nepal	262	21.1***

Yields of flax varieties grown at the Dickinson Substation in triplicate plats in 1925

Variety	C. I. No.	Yield (Bu. per acre)
Long 79	280	11.0
N. D. R. 52	8	11.2
Redwing	320	10.3
Slope	278	10.7
Reserve	19	10.2
Linota	244	10.0
N. D. 40013	241	9.9
N. D. R. 114	13	9.9
N. D. R. 119	326	9.9
Stark	185	9.7
Winona	179	9.5
Chippewa	178	8.5

Yields of proso varieties grown at Dickinson Substation in duplicate plats in 1925

Variety	C. I. No.	Yield (Bu. per acre)
White Ural	4	4.0
Red Russian	508	3.3
Early Fortune	23	3.2
Turghai	31	2.1
Yellow Manitoba	101	2.0
Black Voronezh	27	1.6

* 1 plat
** 2 plats
*** 3 plats

Northern Great Plains Field Station, Mandan (Flax Investigations, J. C. Brinsmade, Jr.) (October 2)

The bundles from the flax nursery were hauled in under cover Saturday September 26, just in time to be safe from the cloudy, drizzling weather that has prevailed ever since. Most of this flax nursery material has already been threshed; the remainder probably will be threshed early next week.

The Argentine flax varieties in field plats are not yet harvested, but may be cut any time now when the weather permits.

Yields in the flax-and-wheat-mixture experiment are given in the following table. Data on yields of flax, grain, and weeds from sample squares, harvested from each plat, have not yet been obtained.

Yields from flax-and-cereal-mixture grown at Northern Great Plains Field Station, in triplicate 50th-acre plats in 1925

Mixture and Rate of Seeding (Pounds per acre)		Average yield (Bu. per acre)
Flax	15	3.2
Wheat	10	10.0
Flax	15	2.1
Wheat	20	14.9
Flax	15	1.5
Wheat	30	17.6
Flax	25	3.2
Wheat	10	9.5
Flax	25	2.5
Wheat	20	14.4
Flax	25	1.7
Wheat	30	16.0

Continued

(Pounds per acre)		(Bu. per acre)
Flax	28	5.5
Wheat	60	18.3
Flax	20	3.2
Oats	8	12.4
Flax	20	2.9
Oats	16	15.7
Oats	48	29.7

All plats were sown on uniformly treated disked corn ground. The varieties used were: Flax, N. D. R. No. 114; Marquis Wheat; Victory Oats.

The first frost of the season occurred the night of September 20, when a temperature of 28 degrees was recorded. Minimum temperature for the last half of September was 27 degrees on the night of September 30. Green flax still standing in the field was not noticeably damaged by the light frosts we have had to date. Maximum temperature for the period was 93 degrees September 16; precipitation .46 inch.

Northern Great Plains Field Station, Mandan (Wheat Investigations, E. R. Ausemus) (October 7)

The following results were obtained from 29 of 165 hybrid strains grown in three rod rows which outyielded the average of 30 Kota check rows.

Percentage of stem-rust and average yield of 29 hybrids grown in single rod rows replicated three times which outyielded the average of Marquis or Kota checks at the Northern Great Plains Field Station, Mandan, N. Dak., in 1925

Cross	Selection	Stem Rust (Per cent)	Yield (Bu. per acre)
Marquis x Erivan	B3-12-4	11	32.8
do	A6-14-2	13	32.1
Marquis x Sunset	A1-16-6	47	32.0
Marquis x Erivan	B6-25-3	15	31.5
*Hard Federation x Marquis	A2-61	60	31.2
Marquis x Erivan	A1-9-1	8	31.0
*Hard Federation x Marquis	A3-34	75	30.8
Marquis x Sunset	B5-7-4	47	30.8
*Marquis x Hard Federation	B1-23	50	30.7
Marquis x Sunset	A4-16-2	60	30.5
Marquis x Erivan	B3-12-6	13	30.5
do	B4-6-3	25	29.6
do	B4-6-1	32	29.6
**Marquis	C. I. 3641	23	29.5
Marquis x Erivan	B4-6-5	10	29.3
do	B3-19-2	18	29.1

Continued

Cross	Selection	Stem Rust (Per cent)	Yield (Bu. per acre)
Marquis x Erivan	B4-25-2	15	28.9
Kota x Hard Federation	8A1-27-1-3	7	28.4
do	8A1-16-8-4	9	28.3
Kota (natural hybrid)	II-19-2	5	27.7
Hard Federation x Kota	9E5-16-5	27	27.4
*Hard Federation x Marquis	A2-53	65	27.4
Marquis x Erivan	B3-13-3	23	27.2
*Marquis x Hard Federation	B3-22	70	27.1
Kota x Ruby	1100-15	Tr	27.0
Kota x Hard Federation	A1-25-2-2	13	26.3
do	8E9-2-1	8	26.1
Marquis x Kota	1556.109	5	26.0
Hard Federation x Prelude	A2-9-2-1	62	26.0
Marquis x Sunset	A4-14-2	38	26.0
***Kota	C. I. No. 5878	2	25.9

* Only one row
** Average of 34 check rows
*** Average of 30 check rows

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (September 30)

It has been very dry here this fall except for the last two or three weeks. Since the first of July the total precipitation recorded was only 2.66 inches, while the average for this period is 4.62 inches. Nearly one-half of the quantity recorded in July, August, and September was recorded in the latter half of September. It has been cloudy and snowing intermittently for the past five or six days.

The wet, chilly weather the past several days has prevented field operations but has given us time to do much work under shelter. Grain grown in the varietal plats has been stored, bushel weights have been recorded, and the milling and baking samples of wheat have been prepared. Nine varietal plats of flax are all that remain to be threshed. None of the material from the spring grain nursery has yet been cleaned, weighed, recorded, or stored.

Winter wheat emerged very irregularly, particularly that sown with ordinary drills in dry seedbeds. The wheat sown with the ordinary drill in the furrow-drill experiments is just now fully emerging.

Joe L. Sutherland, who has ably assisted in the work here this summer, desires to terminate his appointment on October 3 in order to return to his college studies.

Recent visitors at the Substation were Clyde McKee and C. N. Arnett, of the Montana Experiment Station.

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens)

CALIFORNIA

Biggs Rice Field Station, Biggs (C. F. Dunshee) (October 5)

The rice experiments at Biggs and Cortena are progressing favorably, although threshing will be about ten days later than last year.

The annual field day at Cortena was very successful. About one hundred rice growers were present; Dean E. D. Merrill and several members of the Rice Committee also were here. The Butte County Farm Bureau held a meeting here on September 24 attended by about 60 growers.

It is raining very hard here today; it is hoped that it will stop soon so that the ground may be dry enough for binding operations.

University Farm, Davis (W. H. Florell)

Agricultural Experiment Station, Berkeley (F. N. Briggs)

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 26

October 20, 1925
Personnel (Oct. 11-20) and Field Station (Oct. 1-15) Issue

PERSONNEL ITEMS

Dr. J. C. Arthur, agent in the cooperative rust investigations at Purdue University Agricultural Experiment Station, La Fayette, Ind., who went to Europe early in the summer with Dr. F. D. Kern, of the Pennsylvania State College, to study rusts and discuss questions of terminology and classification with leading pathologists, returned recently with reports of a highly satisfactory trip. Doctors Arthur and Kern met nearly all of the most prominent uredinologists of Germany, Sweden, Norway, Denmark, and England and were most cordially received. They came away feeling that they had received the most enthusiastic support.

The following is a direct quotation from Doctor Arthur's letter of October 9, addressed to Dr. H. B. Humphrey:

"We were much surprised and delighted to find that our views were largely commended as to the grouping both of facts and theories, and that the terminology was felt to be a logical outcome of the new ideas. Regarding the introduction of new terms, a few [investigators] expressed a willingness to use them in future writings, but the majority took a conservative stand and thought the old terms might be adapted to the new ideas and be less confusing than to introduce new terms. Nearly all, however, admitted their readiness to follow general usage when approved by standard authors.

"The impression brought back with us is that there is a cordial feeling toward American botany and its exponents, but that the more conservative habits of thought in the Old World often put a restraint upon the adoption of many new and reasonable advances. ********** On the whole, the basic thought in the field of uredinology, as expressed by leading investigators in Europe, differs little from that of individuals of similar standing in America."

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, left Washington October 20 for Lincolnton, Swannanoa, and Marshall, N. C., in connection with wheat breeding investigations. He will be gone about ten days.

The appointment of Gilbert K. Terpening, unskilled laborer in the cereal investigations at the Woodward (Okla.) Field Station, was terminated September 12.

MANUSCRIPTS AND PUBLICATIONS

63 A manuscript, entitled "The Comparative Hardiness of Winter Wheat Varieties," by J. Allen Clark, John H. Martin and John H. Parker, was submitted October 15 for publication as a Department Circular.

64 A manuscript, entitled "Comment on Developing a High-Yielding Strain of Corn," by Frederick D. Richey, was approved October 20 for publication in the Journal of the American Society of Agronomy.

Galley proof of article, entitled "Branching of Rice Plants," by Jenkin W. Jones, for publication in the Journal of American Society of Agronomy, was read October 13.

Page proof of Department Bulletin 1354, entitled "Productiveness of Successive Generations of Self-Fertilized Lines of Corn and of Crosses Between Them," by F. D. Richey and L. S. Mayer, was read October 16.

The article, entitled "Associations between Number of Kernel Rows, Productiveness, and Deleterious Characters in Corn," by Curtis H. Kyle and Hugo F. Stoneberg, appears in the Journal of Agricultural Research, vol. 31, no. 1, p. 83-99. July 1, 1925. (Reprint received October 13.)

The article, entitled "Physiological Evidence on the Genetic Identity of Natural and Synthetic Strains of Wild Emmer," by Olaf S. Aamodt and Moses N. Levine, appears in Phytopathology, v. 15, no. 9, p. 554-558. September, 1925. (Office of Cereal Investigations in cooperation with Minnesota Agricultural Experiment Station.)

The article, entitled "Oat Blast," by Charlotte Elliott, appears in Phytopathology, v. 15, no. 9, p. 564-567. September, 1925. (Received October 15.) (Cooperation between Laboratory of Plant Pathology and Office of Cereal Investigations, Bureau of Plant Industry.)

The article, entitled "Branching of Rice Plants," by Jenkin W. Jones, appears in the Journal of the American Society of Agronomy, v. 17, no. 10, p. 619-623. October, 1925. (This article is based on investigations conducted cooperatively between the Office of Cereal Investigations and the California Agricultural Experiment Station.)

The abstract, entitled "Oat Improvement in the Western Half of the United States," by T. R. Stanton and F. A. Coffman, appears in the Journal of the American Society of Agronomy, v. 17, no. 10, p. 640-641. October, 1925.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (October 19)

Fall seeding of winter grains has been in progress for the past three weeks. Oats and barley were sown under favorable conditions and germination was excellent. It was, and still is, difficult to sow wheat and rye owing to the frequent showers which have occurred in the past two weeks. The advisability of interpreting yields in terms of check plats or rows sown under similar conditions appears desirable in such a season.

The experiments in fall-sown oats have been increased slightly for the season of 1925-1926. Hundreds of selections from promising hybrid material are being tested in the oat nursery. More nursery space is also being occupied in the study of the occurrence of the false wild oat. The oat and wheat varieties grown in plats were treated for smut control with Semesan, as were all but a few check plats of the barley varieties. This mercuric compound has been found very satisfactory during the past three years for controlling both barley smuts. A small per cent of bunt was present in two wheat varieties the past season, but inasmuch as three of the staff were incapacitated three years ago when copper carbonate was used in a similar experiment, Semesan was prepared for this year's treatment.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg)

MISSOURI

Agricultural Experiment Station, Columbia (C. A. Helm)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz)

Iowa State College, Ames (Barberry Eradication, M. A. Smith)

ILLINOIS

Funk Bros. Seed Co., Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran)

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, C. M. Hoffer)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (October 16)

All broomcorn has been harvested for brush. A large number of the grain sorghum plats also are harvested. There remains to be done a lot of seed selection, as well as the collection of data, especially on some of the hybrid material.

On October 12 and 13 a duplicate barley nursery was seeded on tight and sandy soil. The objects are to test barleys for winter resistance and to find a winter barley adapted to this region.

On October 6 the writer went by auto to Guymon, Okla., where some information was obtained concerning the origin of Scarbrough broomcorn which has proven to be a very superior variety in reference to quality of brush. Dalhart, Tex., was visited, and the grain sorghum experiments were observed at the Field Station. The return trip was made across the Texas Panhandle via Dumas, Spearman, and Follett. Sorghums along the route were rather late, but average or better yields will be obtained. A large acreage of sorghums in the Panhandle was being bound for roughage. Wheat was being seeded in a number of places, but the acreage appears to be less than in former years.

Maximum temperature for first half of October, 95 degrees on the 3rd; minimum 33 degrees on the 9th; precipitation, 0.18 inch on 6 days.

KANSAS

Agricultural Experiment Station, Manhattan (D. D. Hill)

Hays Branch Experiment Station, Hays (A. F. Swanson)

COLORADO

Akron Field Station, Akron

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue)

Dickinson Substation, Dickinson (R. W. Smith)

Northern Great Plains Field Station, Mandan (Flax Investigations, J. C. Brinsmade, Jr.)

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (October 16)

The following tables present the yields obtained from winter wheat and spring wheat in the varietal experiments in 1925.

It is snowing today. A precipitation of 0.24 inch was recorded this morning. The total recorded since October 1 is 0.47 inch. The weather has been unusually cool and damp, which has delayed threshing and fall seeding. Considerable threshing and fall seeding yet remains undone. Fall wheat sown after the middle of September has not made much growth. An abundance of soil moisture probably will prevent soil-blowing this winter.

Yields of winter wheat varieties grown in quadruplicate plats at the Judith Basin Substation, Moccasin, Mont., in 1925.

Class and variety	C. I. No.	Average yield (Bu. per acre)
Hard Red Winter		
Nebraska No. 6	6249	28.2
Hays No. 2	6686	27.5
Kharkof	1583	26.2
Karmont	6700	25.5
Kanred	5146	25.3
Montana No. 36	5549	25.0
*Beloglina	1667	24.8
Minturki	6155	24.8
*Kharkof x Newton (163E3-10)**	--	24.6
Newturk (Newton x Turkey)**	6935	24.5
*Kharkof x Newton (163E1-3)**	--	24.4
Turkey	1558	23.4
*Beloglina	1543	23.4
*Turkey (parent of cross 166)	--	23.4
*Kharkof Sel.**	1442-343	22.3
*Kharkof (parent of cross 165)	--	22.3
*Turkey Sel.	3055-159	22.1
*Kanred x Marquis (bulk)	--	21.5
Blackhull	6251	19.9
Sherman	4430	17.8

*Grown only in duplicate plats

**Awnless

Yields of spring wheat varieties grown in quadruplicate plats at the Judith Basin Substation, Moccasin, Mont., in 1925

Class and variety	C. I. No.	Average yield (Bu. per acre)
Hard Red Spring		
Unnamed (from Russia)	3774	29.4
Ceres (Kota x Marquis)	6900	25.6
Kanred x Marquis (1718B9-11)	7371	25.0
Supreme	8026	24.7
Kanred x Marquis (1718B8-11)	7370	24.3
Do (1718B5-14)	--	24.3
Ruby	6047	24.1
Power	3697	23.7
Ladoga	6679	23.6
Preston	3081	23.4
Marquis x Iumillo (II-15-44)	6887	23.3
Kota	6248	23.1
Red Bobs	6255	23.0
*Kanred x Marquis (1718B2-14)	--	23.0
*Hard Federation x Marquis (bulk)	--	22.9
Marquis	3641	22.4
Kanred x Marquis (1718B9-14)	7372	22.3
* Do (bulk)	--	22.1
Red Bobs Sel.	6225-15	21.7
Kitchener	4800	21.5
Haynes Bluestem	2874	15.5
White		
Hard Federation	4733	28.4
Baart	1697	27.2
Quality	6607	26.9
Federation	4734	25.9
Durum		
Peliss	1584	24.8
Nodak	6519	22.8
Akrona	6881	22.6
Mondak	7287	22.3
Kubanka	1440	21.2

*Grown only in duplicate plats

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens)

CALIFORNIA

Biggs Rice Field Station, Biggs (C. F. Dunshee)

University Farm, Davis (V. H. Florell)

Agricultural Experiment Station, Berkeley (F. N. Briggs)

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Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 27

October 31, 1925
Personnel (Oct. 21-31) and Project Issue

PERSONNEL ITEMS

Charles E. Chambliss, associate agronomist in charge of rice investigations, returned on October 21 from an extended trip in the rice-growing districts of the South.

Dr. G. N. Hoffer, pathologist in charge of the investigations of root, stalk, and ear rots of corn, in cooperation with the Purdue University Agricultural Experiment Station, arrived in Washington October 27 and remained for several days in consultation with officials of the Department. He was accompanied by Messrs. Carrel and Callister, of the Potash Importing Corporation, of New York City, with whom Doctor Hoffer has been cooperating in connection with some of his corn-disease investigations.

Miss Isme A. Hoggan, field assistant in the cooperative cereal disease investigations conducted at Madison, Wis., resigned October 31 to accept another position.

Jenkin W. Jones, associate agronomist, and superintendent of the Biggs Rice Field Station, Biggs, Calif., who is in Japan in search of rice varieties, arrived at Kyoto on October 11 and expected to visit the Kyoto Imperial University in the interests of rice culture.

In spite of the fact that very little of this year's seed had been thresh Mr. Jones was fortunate in collecting samples of early and midsummer varieties of rice grown in and around Sakata, Murakami, Nagaoka, Kajiyashiki, and Toyama, and in the Prefectures of Ishikawa and Fukui. In the region of Kyoto mostly midsummer varieties are grown which are now nearly or quite ripe. At the time of writing Mr. Jones expected to continue collecting in the field for about ten days in spite of the frequent rains, and then return to Tokyo. He has bee promised samples by the Imperial Agricultural Experiment Station, at Tokyo, which has an extensive collection of rice varieties from all parts of Japan.

O. C. Kukula, of Prague, Czechoslovakia, and a graduate of the University of Agriculture at Prague, who last spring made his temporary headquarters in the Office of Cereal Investigations to study the Department's methods of cereal breeding, and who was called to his home last August because of the death of his father, has recently written to Dr. C. R. Ball of his decision to remain in Czechoslovakia and operate his own farm. Mr. Kukula had hoped to return to the United States to continue his research. With the aid of this Office he will conduct some breeding investigations with wheat and oats.

C. H. Kyle, agronomist in corn investigations, returned on October 23, from Florence, S. C., where he harvested experimental plats of corn and recorded notes on seed ears.

H. H. McKinney, associate pathologist in the cooperative cereal disease investigations at Madison, Wis., was in Washington during the week of October 19, in connection with plans for the future transfer of his headquarters and those of Dr. R. W. Webb to the Arlington Experiment Farm, Rosslyn, Va.

The appointment of Miss Winifred Watson, clerk in the office of the state leader in barberry eradication in Colorado, was terminated August 31.

G. A. Wiebe, assistant agronomist in charge of the cooperative cereal experiments at the Aberdeen Substation, Aberdeen, Idaho, writing under date of October 17, states that the temperature that morning dropped to 13 degrees above zero. Many acres of potatoes and beets yet remain in the ground, and farmers are hoping that the cold weather will not continue. As a result of excellent crops and good prices, farmers generally are very optimistic.

VISITORS

S. D. Gray, formerly of this Office and now research agronomist of the Soil and Crops Service of the Potash Importing Corporation of America, with headquarters at 10 Bridge St., New York City, was an Office visitor October 22.

C. T. Nolan, of the National Lead Co., New York City, and Chairman of the Flax Development Committee, representing the linseed oil industry, was an Office visitor on October 30 in the interests of flaxseed production.

Dr. G. N. Voronoff, and W. R. Giwago, C.E., of Moscow, Russia, representing the Russian Scientific Expedition in South America, were visitors in the Office of Cereal Investigations during the week of October 26. Their object is to organize and gain preliminary information for an expedition into South America to collect rubber-producing plants as well as general botanical specimens.

Doctor Voronoff was for 18 years in charge of the agricultural experiment station at Tiflis in the Caucasus and is extremely well informed on the botany of the Caucasus. He is now head of the tropical botany department of the Russian Bureau of Applied Botany and Plant Breeding.

IMPORTANT NOTICE

The Office of Plant Disease Survey, of the Bureau of Plant Industry, requests the cooperation of the Office of Cereal Investigations in assembling all available data on the occurrence and severity of various diseases of cereals during the past season, for inclusion in its annual report on diseases of cereals. It is hoped that it will be possible for the members of the Office of Cereal Investigations to cooperate.

Any pertinent observations should be sent to the collaborators of the Plant Disease Survey in the State where the observations were made. The names of these collaborators in the States in which the Office of Cereal Investigations is represented are as follows:

California	W. W. Mackie	Agr. Exp. Sta., Berkeley
Colorado	L. W. Durrel	Agr. Exp. Sta., Ft. Collins
Georgia	O. C. Boyd	State Bd. Entomol., Thomasville
Idaho	C. W. Hungerford	Agr. Exp. Sta., Moscow
Illinois	L. R. Tehon	Sta. Nat. Hist. Survey, Urbana
Indiana	M. W. Gardner	Agr. Exp. Sta., La Fayette
Iowa	I. E. Melhus	Agr. Exp. Sta., Ames
Kansas	L. E. Melchers	Agr. Exp. Sta., Manhattan
Louisiana	C. W. Edgerton	Agr. Exp. Sta., Baton Rouge
Michigan	Ray Nelson	Mich. Agr. Coll., East Lansing
Minnesota	E. C. Stakman	University Farm, St. Paul
Missouri	W. E. Maneval	Agr. Exp. Sta., Columbia
Montana	H. E. Morris	Agr. Exp. Sta., Bozeman
Nebraska	R. W. Goss	Coll. Agr., Lincoln
New York	Charles Chupp	Cornell Univ., Ithaca
North Dakota	Mrs. W. Brentzel	Agr. Exp. Sta., Agricultural College
Ohio	H. C. Young	Agr. Exp. Sta., Wooster
Oklahoma	F. M. Rolfs	Agr. Exp. Sta., Stillwater
Oregon	H. P. Barss	Agr. Exp. Sta., Corvallis
South Dakota	A. T. Evans	Agr. Exp. Sta., Brookings
Tennessee	C. D. Sherbakoff	Agr. Exp. Sta., Knoxville
Virginia	F. D. Fromme	Agr. Exp. Sta., Blacksburg
Washington	F. D. Heald	Agr. Exp. Sta., Pullman
Wisconsin	R. E. Vaughan	Agr. Exp. Sta., Madison

The report on cereal diseases that will be prepared by these collaborators of the Plant Disease Survey will consist of three parts (1) the annual report on cards with maps, (2) the estimates of losses, and (3) answers to questions on special subjects.

A number of cereal diseases are of especial interest and concerning these collaborators have been asked to make as complete reports as possible. They are:

Wheat - Mosaic take-all; flag smut
Flax - Pasmo; rust
Rice - All diseases
Corn - Diplodia ear rot
Alfalfa - Nematode; the new bacterial wilt and stem rot caused by Aplanobacter insidiosum
Red clover - Powdery mildew; nematode.

Among the special questions that are asked are four which apply to practically all parts of the United States. They are:

1. To what extent is copper carbonate being used in your State this year for bunt control? How much do you estimate was used?

2. What treatment are you recommending for controlling oat smut? How much formaldehyde do you estimate was used for this purpose in 1923?

3. To what extent do your farmers treat barley seed?

4. Is the Maryland method of selecting seed corn, by cutting off the butts and tips of ears, being used or tried out in your State? If so, how much and with what success?

PROJECT REPORTS

RUST INVESTIGATIONS

(Dr. H. B. Humphrey, Senior Pathologist in Charge)

SUMMARY OF THE EPIDEMIOLOGY SITUATION FOR THE SEASON OF 1925.

HOW MUCH BLACK STEM RUST DEVELOPED IN 1925, AND WHY?

By E. C. Stakman, E. B. Lambert, and J. J. Christensen

There was an epidemic of stem rust in 1925 in much of the hard red spring-wheat region. Why? Where did it come from?

Possible Sources of Stem Rust in the Hard Red Spring-Wheat Region

There are three possible sources of rust in the hard red spring-wheat region: (1) summer spores which may have overwintered on volunteer grains, fall-sown grains, or wild grasses; (2) summer spores which may have overwintered in Texas or Mexico and which may have been blown northward by the wind; (3) the common barberry.

1. The first source was practically negligible in 1925, as well as in previous years. Experiments on overwintering again were made in the winter of 1924-25; the results confirm those of previous years. The uredinial stage does not overwinter commonly in the barberry eradication area , although there is some circumstantial evidence and a little direct evidence that urediniospores sometimes overwinter in sheltered locations. There is evidence that this overwintering has occurred to a slight extent in Wisconsin, Colorado, Wyoming, and, perhaps, southern Illinois.

2. There is circumstantial evidence that the initial infection of grainfields in the spring-wheat area may be due to urediniospores from the South, but in an average season this rust usually is too late to do much damage. In 1917 and 1918 there was no evidence of infection from urediniospores of southern origin. Evidently inoculum from this source was of little importance in 1922 and 1924. In 1919, 1920, 1921, and 1923, however, there was some evidence that a certain amount may have been initiated by southern spores carried northward on the wind. In 1925 considerable rust probably developed from such urediniospores.

3. Barberries again caused local epidemics and, possibly, regional ones. The question still remains as to the relative responsibility of spores blown from the South and those from the barberry. It cannot be answered ca tegorically, because no two seasons are exactly alike.

Spores Blown from the South in 1925

The stem-rust situation in 1925 was puzzling. There was very little stem rust in Texas or any other southern State before May 20, but by June 1 it was common as far north as southern Kansas. It appeared suddenly and unexpectedly. Where did it come from? It seems probable that it may have been due to urediniospores of Mexican origin. In any case, on June 1 there was a considerable amount of rust in Texas, Oklahoma, and southern Kansas. Then the wind started to blow; from June 2 to 7 it blew almost continuously from Mexico or Texas and Oklahoma. This wind blew straight up the Mississippi Valley for six days. Not only this, but it extended 6,000 feet high, which is unusual. It is probable that many urediniospores were thus carried northward into the hard red spring-wheat region. This was ascertained by the use of slides and by field observations. However, aeciospores from barberries also were carried northward by the same wind. Barberries were generally, although not very heavily, infected in much of Kansas and Missouri; consequently it is possible that they also contribute to the development of the epidemic in the North. By June 15 stem rust had appeared in fields away from barberries as far north as central South Dakota and the southern one-fourth of Minnesota; and by June 20 it had extended as far northward as Marshall County, Minnesota, and Walsh County, North Dakota. The circumstantial evidence indicates, therefore, the possibility that some of the rust which developed in Minnesota and the Dakotas came from initial inoculum of southern origin. It is worthy of note, moreover, that the wind conditions from June 2 to June 7 were unusual in two respects. First, according to the United States Weather Bureau, the wind rarely blows steadily from the south for such a long period of time. Second, the surface winds usually do not extend higher than 1,000 feet, the air above that moving in directions bearing no relation to that at the surface. This year, however, the wind extended 6,000 feet high. Such unusual conditions are not likely to occur very often.

Rust from Barberry

Number of barberries still remaining

There still are many barberries in the barberry-eradication area. As the epidemiology problem is especially puzzling in the hard red spring-wheat States, especially Minnesota and the Dakotas, data are given below showing the number of barberries in some typical counties of these States.

Table 1. Number of barberry bushes found in 1925 on resurvey and second survey of several counties in Minnesota, North Dakota, and South Dakota

Minnesota		North Dakota		South Dakota	
County	Number of bushes	County	Number of bushes	County	Number of bushes
Rock	305	Richland	20	Union	25
Nobles	395	Cass	117	Lincoln	46
Pipestone	46	Traill	82	Minnehaha	8
Murray	130	Barnes	176	Moody	45
Lincoln	71	Morton	124	Brookings	15
Lyon	1,871	Burleigh	104	Deuel	49
Wright	638			Roberts	80
Meeker	412				
Norman	82				

Number of Spores on Barberries

The number of barberries in some of the counties listed in Table 1 may not seem to be very large, but let us consider the number of spores produced on them. The following data are taken from unpublished data obtained in 1922 by Dr. J. J. Christensen.

A bush of average size, about 6 or 7 feet high, has about 35,000 leaves. From actual counts on barberries in Rice County, Minnesota, about 80 per cent of the leaves was infected with rust, making a total of about 28,000 infected leaves. Eight hundred leaves were selected at random, and on them there were 6,720 aecial clusters, making an average of 8+ for each infected leaf. As many as 222 aecial clusters were found on a single leaf. Counts were made on 350 aecial clusters, and it was found that there was an average of 36 cups per cluster, the actual number varying from 1 to 290. The number of spores in a single cup was found to be between 8,000 and 15,000. The average infected leaf therefore produced 2,304,000 aeciospores, and the average bush produced 64,512,000,000 spores, which is about 38 times the population of the world. About eighty bushes were found in Norman County, Minnesota, in 1925 and about the same number in Roberts County, South Dakota. Therefore the number of aeciospores produced in each of these counties was about 5,160,960,000,000. Even then, this represents only the total number of spores on the bushes at any given time, and does not represent the total number produced by a bush in a season. Several successive crops may be produced. The total number of spores

is, therefore, very much greater than has been indicated. Of course, all of these spores do not germinate; neither do all of them alight on a susceptible host. But it is perfectly obvious to anyone that with such an enormous number of spores, many can go astray without seriously jeopardizing the chances of the rust fungus for getting rot on wheat. One must remember, also, that each one of the five trillion spores is capable of producing several hundred thousand more within a week or ten days. Small wonder, then, that big epidemics may start from little beginnings. Opponents of barberry eradication should dust their calculating machines and ponder and figure for a little while.

Not only do barberries produce incalculably large numbers of aeciospores, but the spores do not die over night. There has been a general opinion that they lose their viability rather quickly. However, J. H. Craigie, in the course of epidemiology studies, has found that they will retain their viability for almost three weeks under favorable conditions.

First Appearance of Rust on Barberries in 1925.

Rust was first found on barberries in 1925 as follows:

Ohio	April 18	Missouri	April 25
Indiana	May 12	Kansas	April 30
Michigan	April 25	Nebraska	April 27
Wisconsin	April 27	South Dakota	May 9
Illinois	May 4	Minnesota	May 1
Iowa	April 25	North Dakota	June 2

Barberries began to rust from a month to six weeks before rust appeared in fields away from bushes. Therefore it is likely that much rust spread from those barberries still remaining in the hard red spring-wheat region. Attention again is called to the fact that barberries rusted in Missouri, Kansas, and many of the other States four or five weeks before rust was general in the wheat fields of Texas. Unquestionably, these barberries contributed their share of the rust. It will be necessary to make observations in Kansas and Missouri for several years before conclusions can be drawn regarding the prevalence of rust on barberries in those States and its probable relation to that in the spring-wheat region.

Losses from Stem Rust in 1925 Compared with those in Previous Years

The weather during the summer of 1925 was unusually favorable for the development of rust in much of the hard red spring-wheat region. The abundant rainfall, the high humidity, and high temperatures in the Red River Valley from July 1 to July 15 made conditions ideal for the development of rust. Nevertheless the losses this year were not so great as those of many past years. The following figures on losses have been taken from data in yearbooks of the United States Department of Agriculture and reports of the Plant Disease Survey of the Bureau of Plant Industry, U. S. Department of Agriculture.

During the past decade, there were destructive epidemics in the following years: 1916, 1919, 1920, 1921, 1923, and 1925. The losses were considerably less in 1925 than in most of the other years.

In 1916 stem rust destroyed approximately 61 per cent of the crop in Minnesota; in 1919, 20 per cent; in 1920, 30 per cent; in 1923, 15 per cent; the estimate for 1925 is about 12 per cent. In North Dakota the loss in 1919 was 70 per cent. From 1919 to 1923, inclusive, it ranged from 10 to 20 per cent, while in 1925 it was estimated as 5 per cent. The loss in South Dakota in 1916 was 64 per cent; in 1920 it was 20 per cent; in 1923 and 1924, 10 per cent each; and in 1925, 10 per cent. It seems fairest to compare the figures for 1916 and 1925, because the weather conditions in many regions in 1925 were just as favorable for the development of rust as were those of 1916. In spite of that fact, however, the loss from stem rust during 1925 was very much less than it was in 1916. It seems certain, therefore, that the reduction in the severity of the rust was partly due to the eradication of barberries. It is significant also that the epidemic in 1925 was not so general as that in 1916. In 1925 the severest loss in North Dakota was confined to the southeastern corner; in Minnesota it was particularly severe in the west central part of the State and in certain localities of Stearns County. There is every reason to suppose that if so many barberries had not been eradicated, the epidemic would have been almost, if not quite, as destructive as that of 1916, except in those regions in which there was drought.

Concrete Results from Barberry Eradication

There is every reason to suppose that the eradication of barberries will solve the black stem-rust problem in the States east of the Mississippi River and north of the Ohio. It already has done so in many localities. An equally definite statement can not be made for the spring-wheat States. It has been shown definitely that a certain amount of rust may be blown up from the South into the spring-wheat States. The soft red winter-wheat States seem to be out of the path of general air currents from the southern wheat-growing States to the northern ones. Long time observations, say for a period of 20 years, must be made in the spring-wheat region. Conditions are so different in different seasons that a rather thick cross section of time must be made in order to obtain data for reliable conclusions. In the meantime, the following facts can be emphasized:

1. Barberry eradication will practically solve the black stem-rust problem in the States east of the Mississippi River and north of the Ohio. Destructive epidemics occur only near infected bushes, and what little rust may be blown in from the South comes too late to do much damage except possibly under very unusual conditions. The epidemiology problem in that region, therefore, is relatively simple, although there still are many unanswered questions regarding it.

2. The epidemiology problem in the upper Mississippi Valley is still extremely puzzling and complex, owing largely to the fact that the conditions in different seasons differ so greatly.

3. There are three possible sources of rust in the upper Mississippi Valley (a) overwintered uredinia; (b) spores blown up from the South; and (c) the barberry. One of the most difficult problems in epidemiology studies is to determine the relative responsibility of these three sources.

4. Observations have been made since 1917 on the possible overwintering of the uredinial stage. Uredinia do not overwinter commonly enough north of Texas to affect the situation. Sporadic overwintering may occur even in some of the more northern States, but it now seems safe to conclude that the situation is little affected by this occasional overwintering.

5. The evidence regarding the blowing of spores from the South to the North is conflicting. Possibly it would be more correct to say that no two seasons are alike in this respect. It is perfectly evident that in some seasons very little rust was of southern origin, while in others considerable rust probably was carried northward by south winds, as was undoubtedly true in 1925.

6. In 1925 urediniospores unquestionably were brought in from the South by the unusual wind prevalent during the first week in June. It seems improbable that such exceptional winds are likely to blow very often.

7. There still are fairly large numbers of barberries in the spring-wheat States, infected bushes having been observed beyond the southern limits of this region. Fairly abundant infection was found this year in Missouri and Kansas. Just how much rust on barberries affects the rust situation in the northern States remains to be ascertained.

8. Local epidemics are known to have developed from barberries in the spring-wheat region in 1925. Just how much these local epidemics affect the general epidemic it is difficult to say. It should be borne in mind that a single fairly heavily infected barberry bush of moderate size in Rice County, Minnesota, produced more than five trillion aeciospores. The importance of this fact is perfectly obvious.

9. The weather conditions for the development of stem rust in many regions in 1925 were equally as favorable as those of 1916; in spite of that fact, however, rust did considerably less damage in 1925 than in 1916. It seems perfectly safe to conclude, therefore, that barberry eradication is having its effect in the spring-wheat region. Observations must be made for a long period of years, however, in order to make it possible to draw final conclusions.

EASTERN WHEAT INVESTIGATIONS

(Dr. C. E. Leighty, Agronomist in Charge)

RESULTS WITH ALSTROUM SPELT IN NEW JERSEY

A. C. McLean, County Agricultural Agent in New Jersey, writes to Dr. C. E. Leighty of the results obtained with Alstroum spelt, C. I. No. 3264, sent by the Office of Cereal Investigations in the fall of 1924. Sixty pounds of seed was grown by William H. Hamilton, a dairy farmer near Pennington, Mercer County, on a little more than half an acre of a field of wheat which he had manured before preparing the ground for seeding. Although not seeded until the middle of October the spelt wintered well. It was threshed at the same time as the wheat; the latter averaged 35 bushels to the acre, and the spelt yielded 60 measured bushels of about 28 pounds each.

Mr. McLean hopes to interest other farmers in Alstroum spelt. Mr. Hamilton was interested in it primarily as a feeding crop to grow instead of oats; he will report later how he likes the spelt as a feeding material.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 28

November 10, 1925
Personnel (Nov. 1-10) and Field Station (Oct. 16-31) Issue

DATE OF ISSUANCE OF CEREAL COURIER

Beginning with the December issue the Cereal Courier will appear semimonthly, the issues being dated the 15th and last day of each month. This semimonthly issuance will be continued until April 1, 1926, on which date the trimonthly issues will be resumed and continued during the growing season.

PERSONNEL ITEMS

E. R. Ausemus, junior agronomist in cooperative cereal breeding at the Northern Great Plains Field Station, Mandan, N. Dak., has been authorized to come to Washington after attendance at the meetings in Chicago of the American Society of Agronomy, November 16 and 17. Mr. Ausemus will remain in Washington for about three months to prepare the annual field report of his investigations at Mandan and to consult with project leaders.

Miss Wilmina E. Black, of Denver, Colo., was appointed clerk, effective November 2, in the office of the State leader of barberry eradication in Colorado, to succeed Miss Winifred Watson, recently resigned.

Lytton W. Boyle was appointed agent, effective November 2, in the cooperative investigations of flax diseases at Fargo, N. Dak., to succeed W. E. Brentzel, who resigned August 31. Mr. Boyle will be stationed at Madison, Wis., until the middle of February, when he will continue his investigations at Fargo, N. Dak.

J. C. Brinsmade, Jr., assistant agronomist in cooperative flax experiments, with headquarters at the Northern Great Plains Field Station, Mandan, N. Dak., will come to Washington, D. C., after attending the meetings in Chicago of the American Society of Agronomy, November 16 and 17. Mr. Brinsmade will remain in Washington for about three months to prepare manuscripts for publication and to consult with project leaders.

NOTICE OF MEETINGS OF AMERICAN SOCIETY OF AGRONOMY and LAND-GRANT COLLEGE ASSOCIATION

Attendance at the meetings of the American Society of Agronomy in Chicago, November 16 and 17, has been approved for the following members of the Office of Cereal Investigations:

Dr. C. R. Ball, Senior Agronomist in Charge;

M. A. McCall, Agronomist in Charge of Cereal Agronomy;

F. D. Richey, Agronomist in Charge of Corn Investigations;

J. Allen Clark, Agronomist in Charge of Western Wheat Investigations;

J. R. Holbert, Agronomist in Charge of Cooperative Corn Experiments, Bloomington, Ill.;

A. M. Brunson, Associate Agronomist in Charge of Cooperative Corn Experiments, Manhattan, Kans.;

M. T. Jenkins, Associate Agronomist in Charge of Cooperative Corn Experiments, Ames, Ia.;

A. A. Bryan, Assistant Agronomist in Cooperative Corn Experiments, Ames, Ia.;

J. C. Brinsmade, Jr., Assistant Agronomist in Cooperative Flax Experiments, Mandan, N. Dak.;

E. R. Ausemus, Junior Agronomist in Cooperative Cereal Breeding, Mandan, N. Dak.;

L. C. Burnett, Agent in Cooperative Oat Breeding Experiments, Ames, Ia.

J. G. Dickson, Agent and Pathologist in Charge of Cooperative Investigations of Corn Root, Stalk, and Ear Rots, La Fayette, Ind.

Corn is one of the subjects to be emphasized in these meetings, and most of the men from the Office of Cereal Investigations who are authorized to attend are interested primarily in corn investigations. Mr. Richey is leader of the symposium on The Present Status of Corn Improvement, on which program Messrs. Holbert, Brunson, Dickson and Hoffer also appear. In addition, Mr. Richey is secretary and Messrs. Hoffer and Burnett are members of the committee appointed by the American Society of Agronomy to draft a general program of corn improvement. This service was requested of the Society by the organization of experiment station directors to serve as a basis for work in the Corn Belt undertaken under the provisions of the Purnell Act.

Dr. Ball and Mr. McCall also have been authorized to attend the meetings of the Land-Grant College Association in Chicago November 17 to 19.

MANUSCRIPTS AND PUBLICATIONS

65 A manuscript, entitled "Factors Influencing Results from Rate-and-Date-of-Seeding Experiments with Wheat in the Western United States," by John H. Martin, was approved November 2 for publication in the Journal of the American Society of Agronomy.

66 A manuscript, entitled "The Moving Average as a Basis for Measuring Correlated Variation in Agronomic Experiments," by F. D. Richey, was submitted November 6 for publication in the Journal of Agricultural Research.

67 A manuscript, entitled "Factors Affecting the Development of Flax Rust, Melampsora lini (Pers.) Desm.," by Helen Hart, was approved November 7 for publication in Phytopathology.

Department Bulletin 1356, entitled "Experiments in Rice Production in Southwestern Louisiana," by Charles E. Chambliss and J. Mitchell Jenkins, was received from the Government Printing Office on November 2.

Department Bulletin 1343, entitled "Improved Oat Varieties for the Corn Belt," by L. C. Burnett, T. R. Stanton, and C. W. Warburton, was received from the Government Printing Office on November 3.

The article, entitled "The Loose Smut of Rye (Ustilago tritici)," by Harry B. Humphrey and Victor F. Tapke, appears in Phytopathology, v. 15, no. 10, pp. 598-606, figs. 1-3. October, 1925. (Received November 10)

The Book of Rural Life, published in 10 volumes by the Bellows-Durham Company, 104 South Michigan Ave., Chicago, Ill., which has been in preparation for more than five years, is just off the press. It contains articles by members of the staff of the Office of Cereal Investigations as follows:

Ball, Carleton R.
Grains. Vol. 4, p. 2413-2422.

Chambliss, Charles E.
Rice. Vol. 8, p. 4709-4713.

Clark, J. Allen and Clyde E. Leighty
Wheat. Vol. 10, p. 6005-6017.

Dillman, Arthur C.
Flax for Seed Production. Vol. 4, p. 2027-2029.

Garrison, Harry S.
Corn. Vol. 3, p. 1325-1337.

Leighty, Clyde E.
Buckwheat. Vol. 2, p. 731-735.
Rye. Vol. 8, p. 4848-4852.
Straw. Vol. 9, p. 5312-5314.

Stanton, T. Ray
Oats. Vol. 7, p. 3998-4002.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor)

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg)

MISSOURI

Agricultural Experiment Station, Columbia (C. A. Helm)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz)

Iowa State College, Ames (Barberry Eradication, M. A. Smith)

ILLINOIS

Funk Bros. Seed Co., Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (October 26)

The original survey of Cass, Greene, Macoupin, and Morgan counties was completed during October. The survey has progressed slowly owing to heavy rains and bad roads. It is hoped that the original survey of Pike County can be finished before the field season closes on November 14.

Some survey was done in Du Page County. So many barberries have been found through resurvey and second survey of limited areas in the counties of northern Illinois that a second survey of a large number of counties is absolutely necessary.

Studies on the overwintering of stem rust are being made again at Urbana this fall. Four or five varieties of wheat have been planted in pots in the greenhouse. Stem rust is being produced; just as soon as the plants become hardened they will be put outside for the winter.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (November 2)

The greater number of our field crew resigned in the latter part of September to resume their studies in various colleges and universities. Nine agents of the United States Department of Agriculture and one inspector of the Ohio Department of Agriculture remain on the force to wage war against the common barberry until inclement weather makes further operations impossible.

The necessary resurvey probably will be completed in 67 counties at the close of operations this fall. The progress of the intensive original survey has been much slower in northeastern Ohio than had been anticipated. Since January 1, 1925, only 3.6 counties have been covered by original survey. The territory covered is heavily wooded for the most part, and escaped barberries have been plentiful. It is believed that the careful work and attending high costs of survey have been justified. Up to the present time escaped barberries have been found on 216 properties in Geauga County; the county is only half finished. Two carloads of salt have been used so far in treating escaped barberries in Geauga County; at least another carload will be used within the next two weeks. A carload of salt also will be used within the next few days on escaped barberries in Trumbull County.

In early September Dr. F. E. Kempton accompanied the writer on an inspection trip to several wild areas of barberry in northeastern Ohio, in order to get a clearer conception of our problems in scouting and eradicating escaped barberries in wooded territory.

Studies on the overwintering of black stem rust are being started at the State University.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander) [November 2]

Considering the adverse weather conditions in October, it is fortunate that the field season was terminated on September 30. Most of the field operations in 1925 consisted of second survey, but original survey of the remaining territory also was completed. Original survey of Cass and Aitkin counties was completed. Second survey of Lyon, Lincoln, Meeker, Murray, Nobles, Rock, Cottonwood, Redwood, Pipestone, and Wright counties and part of Stearns County was completed. Although 757 new escaped bushes were found this year no new extensive wild area was found. Most of the bushes found on second survey were located in groves, orchards, and woodlots. In some cases an escaped bush was found in a grove with the nearest known source of seed several miles away.

Nineteen cases of common barberry spreading stem rust to adjacent grains and grasses were found; twelve of these showed that the wheat strain had been spread from common barberry.

Now that the county fairs are over plans are being made for a school campaign. Lesson plans will be sent to rural schools in ten counties and to all high schools having courses in agriculture or biology.

Later a campaign of education will be planned for 2,500 township weed inspectors. Literature will be sent to them during the winter, and after May 15 the importance of barberry eradication will be stressed at weed conferences in all counties.

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (October 31)

The weather for the last half of October was colder than usual. Since the first killing frost on the night of October 18, the remainder of the Harvesting has been done as rapidly as possible.

Threshing of the sorghum plats will start soon; it seems as if the season's work will be completed earlier than in previous years.

At present wheat is not growing very fast, owing to the sudden cold weather and lack of rain.

Maximum temperature for last half of October, 82 degrees on the 22nd; minimum, 16 degrees on the 30th. Precipitation, 0.52 inch, or 0.70 inch for October.

KANSAS

Agricultural Experiment Station, Manhattan (D. D. Hill)

Hays Branch Experiment Station, Hays (A. F. Swanson) (October 31)

Threshing of the sorghums in the experimental plats has just been finished. Inclement weather caused some delay but offered an opportunity for weighing, recleaning, and testing the different lots of varietal seed, preparatory to assembling the data. Sorghum yields this year will vary from 25 to 65 bushels per acre, as compared to about 20 bushels for the best corn.

December weather has prevailed during most of the last half of October, the minimum temperature at one time falling to 12 degrees F. This is the lowest temperature recorded for any October for a number of years.

Because of the unusually chilly October weather, wheat has made slow growth. Wheat seeded as early as September 15 does not yet cover the ground, although there has been sufficient moisture all fall. If such conditions continue there may be danger that the crop will not become firmly enough established to withstand soil blowing. October 27 was the last sowing date in the date-of-seeding experiment with winter wheat. Sowings have been made at rates of one to seven pecks for eight consecutive weeks.

Satisfactory progress is being made by the Station in threshing a heavy crop of pure sorghum seed for distribution to farmers next spring. A Case threshing rig is being used, the bundles with the grain being passed through the machine.

COLORADO

Akron Field Station, Akron

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague) [November 2]

The following results were obtained from 30 out of 65 hybrid strains of wheat grown in three rod rows which outyielded the average of Marquis check rows.

Yields of the leading spring-wheat varieties and hybrids grown in triplicate rod-row nursery experiments at North Platte, Nebr., in 1925

Variety or Cross	Hybrid No.	C. I. No.	Average Yield (Bu. per acre)
Marquis x Sunset	20167A4-14-3	---	16.6
Kota x Hard Federation	20148A1-16-1-3	---	16.4
Marquis x Erivan	1733B3-19-3	---	15.4
Kota x Hard Federation	20148A1-16-4-3	---	15.2
Hard Federation x Prelude	1985A2-9-13-1	---	15.1
Marquis x Kota	Ns. 1656	6898	14.7
Marquis x Erivan	1733B3-12-6	---	14.5
Do	1733B3-19-2	---	14.5
Do	1733A16-14-2	---	14.1
Hard Federation x Prelude	1985B1-5-16-1	---	13.6
Ceres (Marquis x Kota)	Ns. 1658	6900	13.5
Marquis x Erivan	1733B4-6-1	---	13.5
Kota x Hard Federation	20148A1-16-5-4	---	13.2
Hard Federation x Prelude	1985A3-5-2-1	---	13.0
Marquis x Sunset	20167A1-16-6	---	12.9
Kota x Kanred	1918B1-12-1	---	12.9
Hard Federation x Prelude	1985A1-4-3-1	---	12.8
Do	1985A2-111-9-1	---	12.8
Marquis x Erivan	1733B4-25-2	---	12.6
Hard Federation x Kota	20149B1-57-1	---	12.5
Marquis x Prelude	1735A2-15-5	---	12.5
*Kota		5878	12.5
Marquis x Erivan	1733B3-12-4	---	12.3
Hard Federation x Hussar	20151D17-25-2	---	12.2
Hard Federation x Prelude	1982A4-14-1-5	---	12.2
Marquis x Kanred	1718B5-4	---	11.9
Marquis x Sunset	20167A9-12-1	---	11.8
Hard Federation x Prelude	1985B1-5-27-1	---	11.7
Kota x Hard Federation	20148A1-16-7	---	11.7
*Prelude		4323	11.6
Marquis x Erivan	1733B4-6-3	---	11.6
Sunset x Marquis	20166A4-15-2	---	11.6
Hard Federation x Hussar	20151D18-21-3	---	11.5
Hard Federation x Prelude	1985A2-11-16-1	---	11.3
*Marquis		3641	11.2

*Average of 10 to 15 check rows

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue)

Dickinson Substation, Dickinson (R. W. Smith) (October 31)

The following yields were obtained at the Dickinson Substation in 1925 from the rate-and-date-of-seeding experiment with Marquis, Kota, and Nodak wheats, and from the flax-wheat mixtures experiment.

Individual and average yields obtained from a rate-and-date-of-seeding experiment with Marquis, Kota, and Nodak spring wheats sown at the rate of three, four, and five pecks per acre on April 4, April 16, May 1, and May 16, at the Dickinson Substation in 1925.

Date of Seeding	Rate of seeding (pecks per acre)									Av. of 3 var.
	Marquis			Kota			Nodak			
	3	4	5	3	4	5	3	4	5	
	Acre Yield(bu.)		Av.	Acre Yield(bu.)		Av.	Acre Yield(bu.)		Av.	
Apr. 4	16.0	18.2	16.6	17.6	11.8	13.7	13.6	13.0	15.2	15.6	16.5	15.8	15.5
Apr. 16	14.6	13.2	16.9	14.9	11.2	12.2	13.4	12.5	15.8	18.7	21.6	18.7	15.3
May 1	14.6	15.0	17.5	15.7	10.6	12.7	15.0	12.8	16.1	18.0	17.6	17.2	15.2
May 16	9.9	10.9	11.1	10.6	13.8	14.2	13.1	13.7	16.7	18.2	15.6	16.8	13.7
Av.	13.8	14.4	16.1	14.7	11.9	13.2	13.8	13.0	16.2	17.9	18.1	17.4	15.0

Yields and acre values obtained from flax-wheat mixtures grown at the Dickinson Substation in 1925

Rate of seeding (Lbs. per acre)	Yield per acre (bushels) Flax	Wheat	Relative Yield
1. Flax 15 Wheat 10	4.9	6.3	114.2
2. Flax 15 Wheat 20	3.1	5.5	81.3
3. Flax 15 Wheat 30	3.6	7.0	98.1
4. Flax 25 Wheat 10	4.8	3.7	97.2
5. Flax 25 Wheat 20	4.7	4.8	102.1
6. Flax 25 Wheat 30	3.4	6.9	94.4
7. Flax 25 -----	6.4	---	100.0
8. ----- Wheat 60	---	16.7	100.0

Northern Great Plains Field Station, Mandan (Flax Investigations, J. C. Brinsmade, Jr.) (November 3)

The weather in October was exceptionally cold. There also was snow or rain every two or three days throughout the month, which, together with the cold, greatly interfered with field operations.

Threshing of flax in the varietal experiments and the date-of-seeding-and-tillage experiment was completed Oct. 30, and the seed was cleaned Oct. 31. The yields are given in the following tables.

Those for the varietal experiments are from plats reseeded June 1, after the first seeding was practically destroyed by frost. The land was plowed before reseeding. Russian thistles were so thick over most of the seeding that harvesting with a binder or threshing would have been out of the question. Only the eastern half of the first two replications was saved, and the remainder was mowed and discarded.

The date-of-seeding-and-tillage experiment also was on land cropped to corn in 1924.

The yields, although very poor, are comparable with, and perhaps somewhat better than, yields from farmers' fields in the vicinity of Mandan.

Yields of flax grown in the date-of-seeding-and-tillage experiment at the Northern Great Plains Field Station, Mandan, N. Dak., in 1925

Plat Nos.	Treatment*		Date of seeding	Yield (Bu. per acre)
3 and 14		DDHS	5/1	5.6
4 and 15	DD 5/1	DDHS	5/15	5.1
9 and 20		PDHS	5/15	5.1
11 and 22		PDHPkS	6/1	5.0
6 and 17	DD 5/1, 5/15	DDHPkS	6/1	4.8
10 and 21		PDHS	6/1	4.5
5 and 16	DD 5/1, 5/15	DDHS	6/1	4.1
2 and 13		DDHS	4/15	3.7
8 and 19		PDHS	5/1	3.5
7 and 18	DD 5/1, 5/15, 6/1	DDHS	6/15	2.8
12 and 23		PDHS	6/15	2.1

* DD = Double disked; H = Harrowed; S = Seeded; Pk = Packed with Cultipacker; P = Plowed; D = Packed with disk.

Yields of flax grown in duplicate 50th-acre plats at the Northern Great Plains Field Station, Mandan, N. Dak., in 1925

Variety	C. I. No.	Yield(Bu. per acre)
N. D. R. No. 119	326	3.4 *
Long No. 79	230	3.0
Red Wing	320	2.8
Slope	274	2.6
Linota	244	2.4
N. D. R. No. 52	278	1.9
N. D. R. No. 114	13	1.7
N. D. R. No. 40013	241	1.2
Chippewa	178	0.7
Winona	179	0.5
Reserve	19	0.5

* Single plat

Maximum temperature for the month was 62 degrees Oct. 10; minimum - 8 degrees Oct. 28. There were only 7 out of the 31 days in which the temperature did not drop below freezing some time during the 24 hours. The highest minimum temperature for any one day was 38 degrees Oct. 3.

Northern Great Plains Field Station (Wheat Investigations, E. R. Ausemus) (November 3)

Conditions have been very unfavorable for winter wheat. The winter-hardiness nursery sown September 14 had fully emerged on October 16. The stands within the rows are very satisfactory and uniform. Growth has been slow because of the extremely cold weather in October. The varieties were completely frozen down on the 28th, when the thermometer registered 8 degrees below zero.

MONTANA

Judith Basin Substation, Moccasin (P. W. May) (November 2)

The weather in October was unusually wet, cloudy, and cold. There were many more cloudy than clear days. The precipitation was not greatly above average, however.

All fall seeding on the Substation was completed before the bad weather began but there is about three hours' threshing yet undone. In the Judith Basin as a whole considerable threshing and fall seeding remain to be done.

Yields of oats, barley, and flax varieties grown in quadruplicate plats at the Judith Basin Substation, Moccasin, Mont., in 1925

Oats

Variety	C. I. No.	Av. yield (Bu. per acre)
Richland	787	65.0
Markton	2053	64.5
Sixty-Day	165	62.3
Sixty-Day	165-4p4	62.1
Iogren	2024	56.7
Alexander	1592	52.9
Lincoln	738	52.1
Swedish Select	134	51.9
Silvermine	714	51.6
Banner	751	49.0
Victory	742	47.1
Esa	2002	44.4
Liberty Hull-less	---	43.6

Barley

Club Mariout	261	47.9
Composite Mixture*	---	44.8
Mechanical Mixture*	---	44.3
Coast	690	43.2
Meloy	1176	42.5
White Smyrna	195	42.2
Hurst	1304	40.3
Horn	926	38.6
Hannchen	531	33.6

Variety	C. I. No.	Av. yield (Bu. per acre)
	Barley (continued)	
Svanhals	187	31.2
Six-Row July*	1863	29.7
Nepal*	895	29.6
Himalaya	620	26.3
Franconian	680	25.8
Manchuria*	354	24.6
	Flax	
Selection 19-205	186	8.8
Stark	185	8.5
Winona	179	8.4
Argentine Long No. 79	280	8.3
N. D. R. No. 52	275	8.0
Linota	244	7.7
Slope	274	7.7
Chippewa	178	7.1
N. D. R. No. 114	13	7.0
Reserve	19	6.7
N. Dak. No. 40013	241	6.5

*Grown in duplicated plats

The precipitation recorded was 1.26 inches while the average for the month is 1.05 inches. Most of the precipitation fell in the form of snow. The lowest temperature recorded was -19 about October 23. This is perhaps the lowest temperature ever recorded in October at this station.

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens and B. B. Bayles) (October 21)

Warm, dry weather prevailed during September and the first two weeks of October in the Columbia Basin counties of Oregon. At Moro in September only 0.55 inch of rain fell in widely scattered showers, 0.18 inch being the greatest amount during any 24-hour period. On the night of Oct. 10, 0.54 inch of rain fell, barely enough to put the ground into condition to germinate grain. On thoroughly cultivated fallow the moisture is connected, but on fallow given little or no cultivation there is still dry soil between the surface moisture and the conserved moisture four to five inches deeper. After this rainfall seeding operations were started by most farmers. Winter wheat sown Oct. 12 to 14 seems to be germinating satisfactorily and with continued warm weather probably will have emerged in a few days.

The seeding of winter grain on the Station is about completed, including the rotation, tillage, and varietal trials. Mr. Bayles has not quite completed seeding the large winter-wheat nursery of 400 varieties in three rod-row plats triplicated and about 4,000 selections in six-foot head rows. In addition to the nursery at Moro, there have been seeded seven uniform winter-wheat nurseries near the following places: Pendleton, Umatilla County; Lexington and Eightmile, Morrow County; Condon, Gilliam County; Kent, Sherman County; Dufur, Wasco County; and Madras, Jefferson County. The winter wheats seeded in these nurseries in the fall of 1924 completely winterkilled in all nurseries except two, the one near Pendleton and the one near Dufur. The winter wheats were reseeded in the Lexington nursery on February 16.

The following table gives the yields obtained in 1925 from several winter wheat varieties in four nurseries. The yields reported for the nursery at Moro and at Lexington are from February seeding and the yields from the Pendleton and Dufur nurseries from the normal date of fall seeding.

Acre yields of winter-wheat varieties grown in 1925 in nursery rows in four locations in eastern Oregon.

C.I. No.	Variety	Acre yield, bushels				
		Moro	Pendleton	Lexington	Dufur	Average
6688	Mosida	21.5	31.1	15.2	57.1	31.2
----	Crimean 889-5	16.1	39.1	15.7	52.5	30.8
5408	Triplet	24.6	30.9	13.7	51.5	30.2
5146	Kanred	16.6	37.1	12.8	50.7	29.3
----	Triplet, Sel. 1	22.0	33.6	5.9	54.6	29.0
----	Fortyfold x Hyb. 128 (1998A1-1)	27.6	31.7	11.6	45.0	29.0
----	Argentine (Sel. 1569-2)	16.2	33.5	15.7	49.9	28.3
6703	Ridit	21.0	31.9	14.3	47.5	28.7
----	Turkey x Florence (G326-1)	20.7	28.0	15.1	49.0	28.2
4512	Hybrid 128	26.7	34.3	9.3	41.7	28.0
----	Kanred x Marquis (1718B2-11-5)	23.2	30.0	16.2	41.3	27.6
1442	Kharkof	22.2	30.3	13.4	44.5	27.6
----	Hybrid 63	24.1	22.7	18.4	42.9	27.0
7364	Turkey (1571C Purple)	17.9	27.5	13.0	48.5	26.7

Continued

C.I. No.	Variety	Acre yield, bushels				
		Moro	Pendleton	Lexington	Dufur	Average
6251	Blackhull	25.4	28.7	12.5	39.3	26.5
4655	White Odessa	27.3	33.8	14.3	29.4*	26.2
----	P1068 x Preston (634)	18.5	26.1	14.8	43.3	25.7
3055	Crimean	15.9	29.2	13.3	43.5	25.5
4430	Sherman	18.0	33.1	10.9	37.7	24.9
----	Fortyfold x Hyb. 128 (1998A-4-3)	23.8	23.7	10.1	34.5	24.3
4156	Fortyfold	21.5	24.2	14.5	37.2	24.3
----	P1068 x Preston (6896-3-6)	23.9	9.6*	14.1	32.7*	20.1

*Badly winterkilled

CALIFORNIA

Biggs Rice Field Station, Biggs (C. F. Dunshee)

University Farm, Davis (V. H. Florell)

Agricultural Experiment Station, Berkeley (F. N. Briggs)

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BUREAU OF
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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 29

November 20, 1925
Personnel (Nov. 11-20) and Field Station (Nov. 1-15) Issue

PERSONNEL ITEMS

E. R. Ausemus, junior agronomist in charge of cooperative wheat investigations at the Northern Great Plains Field Station, Mandan, N. Dak., arrived in Washington on November 19. He will be engaged for several weeks in the preparation of a report of the investigations of the past year and will confer with specialists of the Office.

J. C. Brinsmade, Jr., assistant agronomist in charge of the cooperative flax investigations at the Northern Great Plains Field Station, Mandan, N. Dak., came to Washington November 19 to spend about three months in the preparation of reports on the progress of the investigations and for conferences with crop specialists.

G. D. George, agent in barberry eradication and cartoonist and illustrator in its publicity campaign, with headquarters at University Farm, St. Paul, Minn., arrived in Washington November 18 to spend several weeks in the preparation of annual reports, maps, posters, etc., in connection with the barberry eradication activities of the past year.

M. A. McCall, agronomist in charge of cereal agronomy investigations, has been authorized to address the American Society of Agricultural Engineers at its meeting in Chicago, Ill., on December 1. He will speak on the subject of certain agronomic factors to be considered in an extension of the use of the combined harvester. He also will visit the exhibits of the National Hay and Grain Show to be held in Chicago at the same time. Mr. McCall will stop at Bloomington, Ill., and La Fayette, Ind., to discuss cooperative corn investigations with representatives of this Office.

F. D. Richey, agronomist in charge of corn investigations, returned from Chicago on November 20, having attended the 18th annual meeting of the American Society of Agronomy on November 16 and 17. Mr. Richey was leader of the symposium on "The Present Status of Corn Improvement," and made the introductory remarks.

VISITORS

H. J. C. Umberger, dean and director of the Division of Extension, Kansas State Agricultural College, Manhattan, Kans., visited the Office on November 12.

CORRECTION

In the Cereal Courier, v. 17, no. 28, p. 368, the following corrections should be made at the end of the list of those in attendance at the meetings of the American Society of Agronomy:

J. G. Dickson, Agent and Pathologist in Charge of Cooperative Wheat-Scab Investigations, Madison, Wis..

G. N. Hoffer, Agent and Pathologist in Charge of Cooperative Investigations of Corn Root, Stalk, and Ear Rots, La Fayette, Ind.

AMERICAN SOCIETY OF AGRONOMY

The following papers were read by members of this Office at the 18th annual meeting of the American Society of Agronomy held at Chicago, November 16 and 17:

Monday, November 16, 8:30 A. M.

Symposium - "Methods and Relations in Extension Work in Agronomy."
Leader: Prof. O. S. Fisher, Extension Service, U. S. Dept. Agr.

"A Simple Test for Detecting the Nutrient Needs of Corn Plants," by Dr. G. N. Hoffer.

Tuesday, November 17, 8:30 A. M.

Symposium - "The Present Status of Corn Improvement."
Leader: F. D. Richey, Office of Cereal Investigations.

Introductory Remarks by F. D. Richey.

"The Relation of Inheritance Studies to Corn Improvement," by Dr. A. M. Brunson.

"The Influence of Temperature Upon the Metabolism and Expression of Disease Resistance in Selfed Lines of Corn," by Dr. James G. Dickson and J. R. Holbert.

"Some Differences in the Functioning of Selfed Lines of Corn Under Varying Nutritional Conditions," by Dr. G. N. Hoffer.

Tuesday, November 17, 2:00 P. M.

Symposium - "Controlling the Quality of Crops."
Leader: Dr. H. L. Walster, N. Dak. Agricultural Experiment Station.

"Breeding Wheat for High Protein Content," by J. Allen Clark.

MANUSCRIPTS AND PUBLICATIONS

A manuscript, entitled "Seed Treatment Experiments for Controlling Stripe Disease of Barley," by R. W. Leukel, J. G. Dickson, and A. G. Johnson, was approved November 16, for publication in Phytopathology.

Galley proof of article, entitled "Influence of Soil Temperature and Moisture on Infection of Young Wheat Plants by Ophiobolus graminis," by H. H. McKinney and R. J. Davis, for publication in the Journal of Agricultural Research, was read November 14.

The article, entitled "Why Agronomy Needs Research in Plant Physiology," by Carleton R. Ball, appears in the Journal of the American Society of Agronomy, v. 17, no. 11, p. 661-675. November, 1925. This was read as a part of the symposium on "Plant Physiology and Agronomic Science," at the meeting of the Society held in Washington, D. C., Nov. 11, 1924.

The article, entitled "The Relation of Plant Physiology and Chemistry to the Study of Disease Resistance in Plants," by James G. Dickson, appears in the Journal of the American Society of Agronomy, v. 17, no. 11, p. 676-695. November, 1925. This was read as a part of the symposium on "Plant Physiology and Agronomic Science," at the meeting of the Society held in Washington, D. C., November 11, 1924. The investigations upon which the article is based were conducted cooperatively between the Office of Cereal Investigations, the Wisconsin Agricultural Experiment Station, and Funk Brothers Seed Company.

The article, entitled "The Tillering of Grain as Related to Yield and Rainfall," by Ralph W. Smith, appears in the Journal of the American Society of Agronomy, v. 17, no. 11, p. 717-725. November, 1925. This was presented at the meeting of the Western Section of the American Society of Agronomy held at Laramie, Wyo., July 21-23, 1924. The investigations reported were conducted cooperatively by the Office of Cereal Investigations and the North Dakota Agricultural Experiment Station at the Dickinson Substation, Dickinson, N. Dak.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA
State College of Agriculture, Athens (R. R. Childs)

VIRGINIA
Arlington Experiment Farm, Rosslyn (J. W. Taylor)

NEW YORK
Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA
Rice Experiment Station, Crowley (J. Mitchell Jenkins) (November 20)

Weather conditions for the past two months have been unfavorable for rice harvest. All the station plats were harvested mainly in October. At times during this period there was scarcely enough good weather to permit thorough curing; finally, however, the entire crop was harvested and put into stacks, where it is in good condition. The weather has been too uncertain to begin threshing operations.

The harvesting of soybeans also has been delayed by bad weather. A few acres still remain, the land being too wet to permit the use of the bean harvester. About 100 bushels of Biloxi soybean seed has been harvested. The seed is of good quality in spite of having remained in the field for two or three weeks after maturity. The yield also is very good.

The total precipitation for the month of October was 8.34 inches, which is 8.34 inches more than recorded for the same month last year, and 4.49 inches greater than the average for the same month during the previous 15 years. Only six times during the 16-year period that records have been kept at this Station has the precipitation for the month of October been five or more inches.

While the heavy rains of October and early November have interfered with farm operations and caused some loss of rice, they have been of tremendous value in freeing the land and streams of salt that had accumulated during the extremely dry weather of the past 18 months.

Tests of samples of water taken from the Mermentau River on November 10, indicate a salt content of only five grains per gallon, while those made on September 30, indicate a salt content of 665 grains per gallon. A test made on November 10, of water from Lake Arthur, indicates a salt content of only four grains per gallon while water from the same locality on September 30, tested 133 grains per gallon.

Agricultural Experiment Station, Baton Rouge (H. Stoneberg)

MISSOURI

Agricultural Experiment Station, Columbia (C. A. Helm)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats, S. M. Dietz)

Iowa State College, Ames (Barberry Eradication, M. A. Smith)

ILLINOIS

Funk Bros. Seed Co., Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran)

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer)

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding Investigations, O. A. Aamodt)

Agricultural Experiment Station, University Farm, St. Paul (Stem Rust Investigations, E. C. Stakman)

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (November 16)

Most of the grain sorghum plats have been threshed and will be fanned as soon as possible. The yields appear to be above average but not so high as in 1924. Maximum temperature, 70 degrees on the 4th; minimum, 24 degrees on the 8th. Precipitation, 0.19 inch on the 5th; 1.68 inches on the 6th; and 0.17 inch on the 14th. The precipitation for the first half of November was 2.04 inches, which has been very beneficial to wheat.

KANSAS

Agricultural Experiment Station, Manhattan (D. D. Hill)

Hays Branch Experiment Station, Hays (A. F. Swanson)

COLORADO

Akron Field Station, Akron

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger)

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue)

Dickinson Substation, Dickinson (R. W. Smith) (November 12)

Yields of 29 hard red spring-wheat hybrids which outyielded the average of Marquis check rows in replicated rod-row nursery experiments at Dickinson, N. Dak., in 1925

Cross or variety	Hybrid No.	C. I. No.	Yield
Marquis x Kota	1656.84	8004	23.0
Kota x Kanred	1980B12-4		21.4
Marquis x Kota	1656.97	8005	20.9
Ceres	1658	6900	20.5
Marquis x Kota	1656.7	8002	20.2
Do	1656	6598	19.5
Do	1656.65	8003	19.5
Do	II-19-11	8009	19.5
Do	1656.4	8001	19.3
Do	II-19-9	8008	19.0
Marquis x Kanred	1718B9-11	7371	18.8
Do	1718B3-14		18.7
Do	II-17-44	8019	18.6
Do	II-19-7	7375	18.5
Kota x Kanred	1980B12-1		18.4
Reliance	1718B8-11	7370	18.3
Marquis x Kanred	II-17-40	8018	18.2
Do	1718B5-10		17.9
Do	II-18-8	7374	17.7
Marquis x Pioneer	52B1		17.4
Marquis x Kota	14-33-1		17.2
Do	1656.109	8006	17.0
Kota natural hybrid		7377	17.0
Kota x Kanred	1980B12-2		16.8
Kota x Ruby	II-19-23	8012	16.6
Marquis x Kanred	II-17-37	8017	16.6
Do	1718B9-14	7372	16.3
Kota x Red Bobs	1655	6897	16.0
Kota x Kanred	1980B12-4		15.7
Marquis		3641	15.4

Northern Great Plains Field Station, Mandan (Flax Investigations, J. C. Brinsmade, Jr.)

Northern Great Plains Field Station, Mandan (Wheat Investigations, E. R. Ausemus)

MONTANA

Judith Basin Substation, Moccasin (R. W. May)

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens)

CALIFORNIA

Biggs Rice Field Station, Biggs (C. F. Dunshee) (November 4)

The rice harvest at Biggs was completed this afternoon, and the whole crop is now under cover. The harvest at Cortena was completed on October 25, and we feel very thankful that we were able to complete it with so little trouble. The weather this fall has been very dry, with the exception of a little rain on October 1; during the past two weeks a dry north wind has been blowing almost constantly. On last Monday (November 2) it was estimated that 90 per cent of the rice area in the State had been cut, and 60 per cent threshed. As the result of the cool weather in August and early September the yield probably will be reduced 15 to 20 per cent below the estimate made in mid-summer. Another ten days of clear weather will see nearly all of the crop under cover.

University Farm, Davis (V. H. Florell)

Agricultural Experiment Station, Berkeley (F. N. Briggs)

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 30

November 30, 1925
Personnel (Nov. 21-30) and Project Issue

PERSONNEL ITEMS

Dr. Carleton R. Ball, senior agronomist in charge, and M. A. McCall, agronomist in charge of cereal agronomy, returned from Chicago on November 21, after having been in attendance at the 18th annual meeting of the American Society of Agronomy on November 16 and 17, and the meetings of the Land-Grant College Association from November 17 to 19.

Word has been received from Jordan, Minn., of the death, on November 24, of Frank J. Piemeisel, a former employee of this Office. Mr. Piemeisel was appointed agent in cereal disease investigations on July 1, 1915. On February 19, 1917, he was appointed scientific assistant in the same investigations. In September, 1917, he enlisted for service in the World War.

G. A. Wiebe, junior plant breeder in charge of the cooperative cereal experiments at the Aberdeen Substation, Aberdeen, Idaho, arrived at Sacaton, Ariz., on November 25 to seed the cereal nurseries that are maintained on the farm of the Office of Acclimatization and Adaptation of Crop Plants. He will remain at Sacaton about ten days.

VISITORS

Dr. Henrik Lundegårdh, Director of the Ecological Station, Hallands Vädjerö, Torekov, Sweden, visited the Office on November 27 to confer with plant pathologists and to learn something of the plant-physiologic research conducted by members of our cereal-disease staff.

MANUSCRIPTS AND PUBLICATIONS

69 A manuscript, entitled "Making Weather to Order for the Study of Grain Diseases," by J. G. Dickson, was submitted November 13 for publication as Bulletin 379 of the Wisconsin Agricultural Experiment Station, in cooperation with the Office of Cereal Investigations.

70 A manuscript, entitled "A Simple Test for Detecting the Nutrient Needs of Corn Plants," by G. N. Hoffer, was approved November 27 for publication in the Journal of the American Society of Agronomy.

PROJECT REPORTS

WESTERN WHEAT INVESTIGATIONS

(J. Allen Clark, Agronomist in Charge, and Karl S. Quisenberry, Associate Agronomist)

New Varieties of Wheat

Announcements have been made from time to time of names applied to new and improved wheat varieties. Through a cooperative agreement between the American Society of Agronomy and the Bureau of Plant Industry, of the U. S. Department of Agriculture, new varieties are to be registered. Since the publication in 1922 of U. S. Dept. Agr. Bul. 1074, entitled "Classification of American Wheat Varieties," 18 new varieties of wheat have been developed and named. (See Cereal Courier, vol. 15, no. 24, p. 269-272. 1923; vol. 17, no. 4, p. 64-66. 1925.) Applications for the registration of 13 of these varieties already have been received. In addition, applications have been received for further productions. The varieties which have not been announced already are as follows:

Ceres, C. I. No. 6900

Ceres is an awned hard red spring wheat bred from a Marquis x Kota cross at the North Dakota Agricultural Experiment Station by Prof. L. R. Waldron. The cross was made in 1918. The selection known as Ns 1658 was made in 1921. For the past three years Ceres has outyielded both parents by more than six bushels per acre, on an average. In addition to producing high yields this new variety is resistant to stem rust and is earlier than both parents. It has been increased for commercial distribution since 1924.

Reliance, C. I. No. 7370

Reliance also is an awned hard red spring wheat although bred from a Kanred x Marquis cross made in 1917. The selection, known as 1718B8-11, was made by J. A. Clark at Chico, Calif. It was first grown in rod-row nursery experiments at Moccasin, Mont., in 1921, together with about 100 other selections. Since 1922 the best strains have been tried in North Dakota, Minnesota, Nebraska, and Colorado. Reliance has proved to be the best of the early selections and has been included in 40 nursery and plat experiments at 12 stations in the spring-wheat States. On the average it has outyielded Marquis by about four bushels per acre. It also is more resistant to stem rust than Marquis. This variety was grown for the first time in an increase field at the Northern Great Plains Field Station, Mandan, N. Dak., in 1925, together with a similar field of Ceres. The results were recorded in the Cereal Courier, vol. 17, no. 23, p. 322. 1925. Bushel lots of Reliance and Ceres wheats were supplied to the Pillsbury Flour Mills for testing. On October 28, 1925, they reported favorable results for both wheats and assured their cooperation in connection with the further production of the varieties.

Marquillo, C. I. No. 6887 (Minn. No. 2202)

Marquillo is an awnletted variety of hard red spring wheat bred from a Marquis x Iumillo (durum) cross made at St. Paul, Minn., in 1914, in cooperation with the Minnesota Agricultural Experiment Station. Marquillo was first known as Selection II-15-44. It represents a successful cross-over of the rust resistance of the durum parent with the quality of Marquis. It was distributed to agricultural experiment stations by Dr. H. K. Hayes in 1921 and since that time has been in 35 nursery and plat experiments at 16 stations in the northern United States and Canada. Marquillo has been found to be very resistant to stem rust and a better yielder than Marquis. Milling and baking experiments with Marquillo compare favorably with those of Marquis, except in color of flour and crumb.

Hope, C. I. No. 8178

Hope is an awned variety of hard red spring wheat which is immune or very resistant to black stem rust. It was developed from a cross of Vernal (emmer) x Marquis made in 1915 by Edgar S. McFadden. The selection was made on Mr. McFadden's farm near Webster, S. Dak., in 1923. For the past three years it has been rust free, while Marquis has had an average rust infection of 57 per cent. Hope was first known as H 49-24; it appears to be the best of several selections from the same cross.

Progress, C. I. No. 6902

Progress is another awned hard red spring wheat resistant to stem rust. It is a selection of Java, made by Prof. E. J. Delwiche in 1911 at the Ashland Branch Station, Ashland, Wis. It was early known as Wis. Ped. M-16-11 but was named and distributed for commercial growing in the spring of 1923.

Minard, C. I. No. 6690 (Minn. No. 2199)

Minard is a hard red winter variety developed from a cross between two Turkey strains by the Minnesota Agricultural Experiment Station. The cross was made in 1902, and the selection was made in 1915. The yields from nursery and plats at University Farm, St. Paul, and at the substations in Minnesota since 1916, compare favorably with those of Minturki. Minard produces exceptionally hard or corneous kernels of good milling and baking quality.

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C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 31

December 15, 1925
Personnel (Dec. 1-15) and Field Station (Nov. 16-30) Issue

PERSONNEL ITEMS

Jenkin W. Jones, who is traveling in the Orient in search of varieties of rice that may be adapted for cultivation in California, where he is superintendent of the Biggs Rice Field Station, writes from Mujo, Chosen, on November 18 of his travels in the principal rice areas of Chosen (Korea). Nearly all the commercial rice varieties growing on the lowlands have been introduced from Japan during the past 10 years. On the uplands and in the colder sections of Chosen some native varieties are still being grown. The acre yields of rice are much lower in Chosen than in Japan, apparently owing to poorer farming methods and lack of land fertilization.

Mr. Jones expected to leave for Nagasaki on November 20 in order to take a boat for Shanghai, whence he intended to proceed to Nanking, China. Except for a disagreeable cold Mr. Jones reported that he was in good health.

M. A. McCall, agronomist in charge of cereal agronomy investigations, returned on December 4 from Chicago. He read a paper, entitled "Some Factors to be Considered in Extending the Use of the Combine Harvester," at the dinner program of the Farm Power and Machinery Division of the American Society of Agricultural Engineers, at the Great Northern Hotel on the evening of December 1.

Dr. R. W. Webb, associate pathologist in the cooperative cereal disease investigations conducted at Madison, Wis., arrived in Washington on December 2. Doctor Webb's headquarters have been transferred from Madison to Arlington Farm, Rosslyn, Va., where he will continue investigations on certain phases of the virus diseases of plants conducted jointly with H. H. McKinney.

VISITORS

Hon. B. Harris, Commissioner of the Department of Agriculture, Commerce and Industries of the State of South Carolina, and J. S. Watkins, Feed Chemist connected with the same Department, visited the Office on December 14. They desired information aiding in the identification of Fulghum and Red Rustproof oats, particularly from grain samples.

Dr. Henrik Lundegardh, Director of the Ecological Station, Hallands Väderö, Torekov, Sweden, who visited the Office late in November, returned to Washington on December 11 from a visit in New Jersey. He gave a talk to the botanists and agronomists of the Bureau of Plant Industry on the investigations in plant ecology that are being conducted on the island where his ecological station is located.

Dr. Guilio Savastano, Italian plant pathologist from Catania, Sicily, was an Office caller on December 1. Doctor Savastano will remain in Washington for a year's study in the Laboratory of Plant Pathology, of the Bureau of Plant Industry. Later he expects to go to California to study citrus diseases at the University of California.

MANUSCRIPTS AND PUBLICATIONS

71 A manuscript, entitled "The Relation of Inheritance Studies to Corn Improvement," by A. M. Brunson, was approved December 7 for publication in the Journal of the American Society of Agronomy.

72 A manuscript, entitled "Some Differences in the Functioning of Selfed Lines of Corn under Varying Nutritional Conditions," by G. N. Hoffer, was approved December 7 for publication in the Journal of the American Society of Agronomy.

73 A manuscript, entitled "Introductory Remarks to the Symposium on 'The Present Status of Corn Improvement,' " by Frederick D. Richey, was approved December 7 for publication in the Journal of the American Society of Agronomy.

74 A manuscript, entitled "Further Experiments in the Control of Bunt of Wheat and the Smuts of Barley and Oats," by R. W. Leukel, was approved December 10 for publication in Phytopathology.

75 A manuscript, entitled "Some Factors to be Considered in Extending the Use of the Combine Harvester," by M. A. McCall, was approved December 11 for publication in the Journal of the American Society of Agricultural Engineers.

76 A manuscript, entitled "Intergeneric Hybrids in Aegilops, Triticum, and Secale," by C. E. Leighty, W. J. Sando, and J. W. Taylor, was submitted December 15 for publication in the Journal of Agricultural Research.

Galley proof of the article, entitled "A Concentration Gradient in Corn Stalks," by Annie May Hurd-Karrer, for publication in the Journal of General Physiology, was read December 9.

The article, entitled "A Report of the Barberry Eradication Campaign in South Dakota," by Raymond O. Bulger, appears in the 15th Annual Report of the State Entomologist of South Dakota for the Period Ending June 30, 1924, p. 65-72. [1925]

Galley proof of article, entitled "Studies on Ophiobolus graminis Sacc. and the Take-All Disease of Wheat," by Ray J. Davis, for publication in the Journal of Agricultural Research, was read December 15.

Bulletin 68 of the Wisconsin State Department of Agriculture, by Wm. A. Walker and Noel F. Thompson, entitled "Black Stem Rust and the Progress of Barberry Eradication in Wisconsin," was received in November, bearing date of May, 1925. (Barberry eradication in Wisconsin is conducted jointly by the Wisconsin Department of Agriculture, the Agricultural Extension Service of the University of Wisconsin, and the Office of Cereal Investigations.)

The article, entitled "Webster, a Common Wheat Resistant to Black Stem Rust," by E. C. Stakman, M. N. Levine, and Fred Griffee, appears in Phytopathology, vol. 15, no. 11, p. 691-698. November, 1925. (The data presented in this article are based on investigations conducted cooperatively by the Office of Cereal Investigations and the Minnesota Agricultural Experiment Station.)

The article, entitled "New Seed Disinfectants for the Control of Bunt of Wheat," by W. H. Tisdale, J. W. Taylor, R. W. Leukel, and Marion A. Griffiths, appears in Phytopathology, vol. 15, no. 11, p. 651-676. November, 1925.

Farmers' Bulletin 1464, entitled "Barley: Culture, Uses, and Varieties," by Harry V. Harlan, dated October, 1925, was received from the Government Printing Office on December 11.

NOTICE TO FIELD EMPLOYEES

The Office of Personnel and Business Administration and the Chief of the Bureau of Plant Industry have called attention to the necessity for the continued use of the letters "U. S." before the words "Department of Agriculture" when listing branch offices in telephone and city directories.

The Chief of the Bureau of Plant Industry refers to his memorandum of January 12, 1925, in which the following paragraph occurs:

> "In listing official telephones in telephone directories, the titles assigned in this Directory of Field Activities should be used, preceded in each case by the letters "U. S." This will bring together in a directory all telephones we may have at any one place."

Each field man of this Office was sent a copy of the Directory of Field Activities early in this calendar year.

FIELD STATION CONDITION AND PROGRESS

HUMID ATLANTIC COAST STATES (South to North)

GEORGIA

State College of Agriculture, Athens (R. R. Childs)

VIRGINIA

Arlington Experiment Farm, Rosslyn (J. W. Taylor) (December 9)

The weather for the past month has been favorable for the growth of fall-sown cereals, and the plants should go into the winter with less foliage than usual. The rainy weather of October and November prevented the seeding of a portion of the contemplated wheat and rye experiments, and unusually heavy rainfalls did some damage by washing out in certain sections of the varietal tests. Unfavorable weather prevented the seeding of the seed-treatment experiment involving the use of several sulphates, nitrates, and chlorides. The data obtained from the wheat plats of this experiment the past crop year failed to show any decided stimulation for any treatment used.

Seedings of the many hybrids and parents of grain crosses have been made in the greenhouse. The bulk of this material represents matings or descendants of distant crosses such as interspecific or intergeneric. Some of this material has reached the point where fertility is high enough to permit obtaining a population of sufficient size to warrant genetic analysis. Other lines never will reach this stage.

NEW YORK

Cornell University Agricultural Experiment Station, Ithaca (W. T. Craig)

HUMID MISSISSIPPI VALLEY STATES (South to North)

LOUISIANA

Rice Experiment Station, Crowley (J. Mitchell Jenkins)

Agricultural Experiment Station, Baton Rouge (H. Stoneberg)

MISSOURI

Agricultural Experiment Station, Columbia (C. A. Helm)

TENNESSEE

Agricultural Experiment Station, Knoxville (L. S. Mayer)

IOWA

Agricultural Experiment Station, Ames (M. T. Jenkins)

Agricultural Experiment Station, Ames (Investigation of Crown Rust of Oats S. M. Dietz)

Iowa State College, Ames (Barberry Eradication, M. A. Smith)

ILLINOIS

Funk Bros. Seed Co., Bloomington (Corn Root and Stalk Rot Investigations, J. R. Holbert)

Post Office Building, Urbana (Barberry Eradication, G. C. Curran) (December 4)

It was necessary to suspend field activities at the end of the second week in November on account of unfavorable weather. It was not possible to complete the original survey of Pike County as planned. The 15 per cent of the area of the county left will be completed next year.

Considerable progress was made this month with overwintering studies. About 600 wheat seedlings were artificially inoculated with black stem rust in the greenhouse. The infected seedlings were then divided into three lots. Lot No. 1 was removed from the greenhouse 72 hours after inoculation. Lot No. 2 was left in the greenhouse until rust flecks began to show on the leaves. Lot No. 3 was left in the greenhouse until the rust was well developed. All the plants were then set outside for the winter. Spore germination tests will be made every two weeks during the winter. About 10 plants from lots Nos. 1 and 2 will be taken into the greenhouse at two week intervals and observed for development of rust.

INDIANA

Purdue University Agricultural Experiment Station, La Fayette (Corn Root, Stalk, and Ear Rots, G. N. Hoffer)

Purdue University Agricultural Experiment Station, La Fayette (Leaf Rust Investigations, H. S. Jackson and E. B. Mains)

College of Agriculture, Purdue University, La Fayette (Barberry Eradication, W. E. Leer)

OHIO

College of Agriculture, Ohio State University, Columbus (Barberry Eradication, J. W. Baringer) (November 30)

The weather of the latter part of October and the first part of November was most unfavorable for barberry eradication field operations in Ohio. There was a superabundance of rain which rendered roads almost impassable in the northeastern part of the State where our field men had expected to treat hundreds of escaped barberries before the close of the season. The delivery of two carloads of salt was much delayed owing to poor freight service. When the salt finally arrived the greater portion of it was placed in free storage on farms at or near the places where it will be used next spring. All but one of our field agents resigned on or before November 21.

The escaped-barberry situation in northeastern Ohio has become more interesting then anyone had anticipated. The original survey in Portage County has been completed and escaped barberries were found therein on 119 farms. Thirty-five per cent of Columbiana County was surveyed. Escaped barberries were found on 28 farms. In Mahoning County escaped barberries were found on 18 farms in the western two-thirds of the county. The survey of Trumbull County was completed; escaped barberries were recorded on 107 farms. Although the survey of Geauga County was only half finished it took first place with escaped barberries found and destroyed on 259 farms, besides 40 good leads which have not been thoroughly investigated. It has been estimated that escaped barberries will be recorded on 500 farms in Geauga County before the original survey of that county is completed. Undoubtedly, next year's survey of the unfinished portion of northeastern Ohio will reveal the presence of large numbers of escaped barberry areas.

Observations on the overwintering of the urediniospores of Puccinia graminis tritici and on the overwintering of the mycelium of the same fungus are being made at Columbus. On November 21, 38 per cent of the urediniospores was found to be viable in the collections made from plants which had been exposed to outside weather conditions since October 10. The mycelium in plants placed outside for the same length of time produced uredinia readily when the plants were subjected to favorable greenhouse environment.

MICHIGAN

Agricultural College, East Lansing (Barberry Eradication, W. F. Reddy)

WISCONSIN

Agricultural Experiment Station, Madison (Wheat Scab Investigations, J. G. Dickson)

Agricultural Experiment Station, Madison (Wheat Rosette and Take-All Investigations, H. H. McKinney)

Department of Agriculture, State Capitol Annex, Madison (Barberry Eradication, W. A. Walker)

MINNESOTA

Agricultural Experiment Station, University Farm, St. Paul (Wheat Breeding and Stem Rust Investigations, H. K. Hayes, O. S. Aamodt, and E. Stakman) [December 14]

Yields of spring wheat varieties and hybrids grown in replicated rod-row nursery experiments at University Farm, St. Paul, Minn., in 1925.

Variety	Nursery Stock No.	Yield	Variety	Nursery Stock No.	Yield
Marq.x Kanred	II-18-8	41.2	Marq.x Kanred	II-17-28	35.6
Marq.x Kota	II-19-46	41.0	Marq.x Iumillo	II-15-44	35.6
Marq.x Kanred	B9-11	40.6	Kota x Ruby	II-19-49	35.5
Marq.x Kanred	II-17-40	40.4	Kota x Ruby	II-19-39	35.4
Marq.x Kanred	II-18-46	40.3	Marq.x Kanred	II-17-2	35.3
Marq.x Preston	II-15-8	39.9	Marq.x Kanred	II-17-4	35.3
Marq.x Preston	II-15-24	39.8	Marquis	Chk (266)	35.3
Marq.x Kota	II-19-57	39.5	Progress	III-25	35.3
Marq.x Kota	N.D.1656	39.5	Marq.x Kota	1656-28	35.2
Marquis	Chk (302)	39.4	Marq.x Kanred	B8-11	35.2
Marq. x Kanred	II-17-16	39.4	Marq.x Kanred	II-17-3	35.2
Kota Nat. Cross	II-18-56	39.2	Marq.x Kanred	II-18-48	35.2
Marq.x Kanred	B2-5	39.0	Marq.x Kanred	II-18-15	35.0
Marq.x Kanred	II-17-43	39.0	Kota x Ruby	II-19-40	35.0
Marq.x Kanred	II-18-44	39.0	Kota x Ruby	II-19-34	34.9
Mindum	I-00-52	38.7	Marquis	Chk (140)	34.9
Marquis	Chk (230)	38.5	Kota x Ruby	II-19-26	34.8
Marq.x Kanred	II-17-37	38.5	Kota x Ruby	II-19-48	34.7
Kota Nat. Cross	II-18-17	38.5	Marquis	Chk (86)	34.7
Marq. x Kanred	II-17-14	38.4	Marquis	Chk (212)	34.7
Marq.x Kanred	II-17-36	38.4	Marquis	Chk (122)	34.6
Kota Nat. Cross	II-18-28	37.9	Kota Nat. Cross	II-18-33	34.5
Marq.x Kanred	II-18-51	37.8	Kota x Ruby	II-19-42	34.4
Ceres	N.D.1658	37.7	Marquis	Chk (356)	34.4
Marq.x Kanred	II-17-45	37.6	Marq.x Kanred	II-17-25	34.4
Kota Nat. Cross	II-18-20	37.6	Kota x Ruby	II-19-55	34.1
Marq.x Kota	II-19-51	37.6	Marq.x Iumillo	II-15-43	34.0
Marq. x Kota	1657-139	37.6	Kota Nat. Cross	II-18-21	34.0
Marq.x Bluestem	II-15-41	37.5	Kota Nat. Cross	II-18-16	33.8
Marquis	Chk (320)	37.4	Marq.x Kanred	II-18-50	33.2
Marq.x Kanred	II-18-49	37.3	Kota x Ruby	II-19-54	33.0
Marq.x Kota	1658-164	37.3	Marquis	Chk (194)	32.9
Marq. x Preston	II-15-16	37.3	Kota x Ruby	II-19-44	32.8
Marquis	Chk (158)	37.1	Marq.x Kota	1656-35	32.7
Marq.x Preston	II-15-13	37.0	Pentad	III-17	32.6
Marq.x Kanred	II-17-23	36.9	Kota Nat. Cross	II-18-19	32.4
Marq.x Kanred	II-18-47	36.9	Parkers Marquis	III-25	32.3
Marq.x Kota	II-19-9	36.8	Marquis	Chk (248)	32.2
Marquis	Chk (284)	36.5	Marq.x Iumillo	II-15-51	32.1
Marq.x Kota	II-19-53	36.4	Marq.x Kanred	B9-14	32.0
Marq.x Kanred	II-17-22	36.4	Kota x Ruby	II-19-43	31.9
Marquis	Chk (176)	36.3	Marq.x Kota	II-19-45	31.7
Kota (Arny's)	Bulk	36.3	Kota x Ruby	II-19-23	31.4
Marq.x Bluestem	II-15-39	36.2	Marquis	Chk (338)	31.4
Marquis	Chk (194)	36.0	Marq.x Kota	1657-154	31.2
Marq.x Kota	II-19-47	36.0	Marq.x Kota	1656-4	29.7
Kota Nat. Cross	II-19-2	35.8	Kota Nat. Cross	II-18-37	29.4
Kota Nat. Cross	II-18-31	35.8	Dicklow-Sevier	G40	26.0
Marq.x Kota	II-19-11	35.8	Dicklow-Sevier	G149	21.9

Agricultural Experiment Station, University Farm, St. Paul (Barberry Eradication, L. W. Melander)

GREAT PLAINS AREA (South to North)

OKLAHOMA

Woodward Field Station, Woodward (J. B. Sieglinger) (December 2)

There was no precipitation in the last half of November, and the temperature was mild. Wheat made some growth. The weather was favorable for hauling in sorghums and threshing operations.

On a private trip to Stillwater the writer noticed very little rough feed, the greater portion being in the vicinity of Woodward. Wheat, though not overly large or vigorous, is generally being pastured.

Maximum temperature for the last half of November, 76 degrees on the 24th; minimum, 20 degrees on the 28th; precipitation 0; for the month of November, 2.04 inches.

KANSAS

Agricultural Experiment Station, Manhattan (D. D. Hill)

Hays Branch Experiment Station, Hays (A. F. Swanson)

COLORADO

Akron Field Station, Akron

Agricultural College, Ft. Collins (Barberry Eradication, E. A. Lungren)

NEBRASKA

North Platte Substation, North Platte (G. F. Sprague)

College of Agriculture, University Farm, Lincoln (Barberry Eradication, A. F. Thiel)

SOUTH DAKOTA

College of Agriculture, Brookings (Barberry Eradication, R. O. Bulger) (November 19)

Field operations in barberry eradication were terminated on November 7. Cold, inclement weather the latter part of October made field work very disagreeable. However, it seemed advisable to continue so that no small portion of counties might remain uncompleted this fall. Second survey constituted the major activity of the field forces. Resurvey was carried on in connection with second survey. Educational work and stem-rust surveys also were emphasized during the season.

Approximately 10½ counties were covered on a second complete survey for barberries. Resurvey was done in connection with second survey in all of these counties, and in addition some resurvey was made in areas of escaped barberries. Four hundred and forty-six bushes, of which 138 were escapes, and 285 seedlings, were found on 66 different properties on second survey this year. In addition, 223 barberries, of which 13 were escapes, were found on 11 different properties in connection with other activities of the campaign. This makes a grand total of 671 bushes, of which 151 were escapes, and 285 seedlings, found on 77 different properties. All of these properties are areas upon which barberry bushes were found for the first time.

Results of the second survey show an average of 42.4 bushes and 27.1 seedlings on 6.28 properties per county. Nearly every barberry bush and seedling found this year showed heavy aecial infection. In view of the fact that all of these barberries were found in counties in the spring-wheat area, it is believed that they were responsible for much of the stem-rust infection in South Dakota this year.

A very large proportion of properties with new barberries was found on second survey in Brookings County. While only the western half of this county has been completed, 58 barberries and 12 seedlings were found on 14 different properties. It is very probable that the eastern half of this county will have equally as many new properties with barberry bushes. If so, Brookings County will be the banner county in second survey from the standpoint of new properties having barberry bushes. Severe stem-rust epidemics have been evident in western Brookings County for the last few years. Undoubtedly the barberries found this year were responsible for much of this infection.

Only nine sprouting bushes on seven different properties were found as a result of resurvey in 12½ counties. Thus it appears that chemical treatment of barberry bushes is a highly efficient method of killing them.

NORTH DAKOTA

Agricultural Experiment Station, Agricultural College (W. E. Brentzel)

Agricultural Experiment Station, Agricultural College (Barberry Eradication, G. C. Mayoue)

Dickinson Substation, Dickinson (R. W. Smith)

Northern Great Plains Field Station, Mandan (Flax Investigations, J. C. Brinsmade, Jr.)

Northern Great Plains Field Station, Mandan (Wheat Investigations, E. R. Ausemus)

MONTANA

Judith Basin Substation, Moccasin (R. W. May) (November 30)

The weather in November was quite mild, permitting threshing of much of the unthreshed grain throughout this district. There was an absence of the strong winds that usually occur in November.

The soil contains an abundance of moisture which lessens the probability of soil-blowing throughout the winter. As a result of weather and soil conditions winter wheat is unusually vigorous for this season of the year.

The following yields were obtained from the date-and-rate of seeding experiment with Marquis, Hard Federation, and Mondak wheat, and from the flax-wheat mixtures experiment.

Yields obtained from a date-and-rate-of-seeding experiment with Marquis, Hard Federation and Mondak spring wheats sown at the rate of 3, 4, and 5 pecks per acre on April 21, May 6, and May 19, 1925, at the Judith Basin Substation, Moccasin, Mont.

Date of Seeding	Variety, rate of seeding (pecks) and yield (Bu. per acre)												Average of 3 varieties
	Marquis				Hard Federation				Mondak				
	3	4	5	Av.	3	4	5	Av.	3	4	5	Av.	
Apr. 21	20.0	20.0	20.8	20.3	27.5	24.2	30.8	27.5	16.8	20.0	23.8	20.9	22.9
May 6	21.3	17.9	20.4	19.9	22.5	23.3	27.1	24.3	20.0	22.1	22.9	21.7	21.9
May 19	19.2	15.8	18.8	17.9	18.8	21.7	23.8	21.4	16.3	16.7	21.7	18.2	19.2
Average	20.2	17.9	20.0	19.4	22.9	23.1	27.2	24.4	18.4	19.6	22.8	20.3	21.3

Yields of flax-wheat mixtures at the Judith Basin Substation, Moccasin, Mont., in 1925.

Crop and Rate of Seeding (Lbs. per acre)	Yield (Bu. per acre)		Relative Yield (Per cent)
	Flax	Wheat	
Flax 15 Wheat 20	1.4	11.6	86
Flax 15 Wheat 30	1.8	15.3	113
Flax 25 Wheat 20	2.3	10.0	88
Flax 25 -----	8.3	----	100
----- Wheat 60	---	16.7	100

State College of Agriculture, Bozeman (Barberry Eradication, W. L. Popham)

WESTERN BASIN AND COAST AREAS (North to West and South)

IDAHO

Aberdeen Substation, Aberdeen (G. A. Wiebe)

Agricultural Experiment Station, Moscow (Stripe Rust Investigations, C. W. Hungerford)

OREGON

Sherman County Branch Station, Moro (D. E. Stephens)

CALIFORNIA

Biggs Rice Field Station, Biggs (C. F. Dunshee)

University Farm, Davis (V. H. Florell) (December 1)

The cereal experiments at Davis are now all sown with the exception of a portion of Dr. H. V. Harlan's barley nursery. Although the seed bed was dry, a precipitation of 0.56 inch since sowing the seed will insure prompt germination.

Agricultural Experiment Station, Berkeley (F. N. Briggs)

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JAN 14 1926
BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture
(NOT FOR PUBLICATION)

Vol. 17 No. 32

December 31, 1925
Personnel (Dec. 16-31) and Project Issue

PERSONNEL ITEMS

Dr. C. R. Ball, senior agronomist in charge, left Washington December 27 for Kansas City, Mo. He attended the council meetings of the American Association for the Advancement of Science and the sessions of the Botanical Society of America, the American Society of Plant Physiologists, and the American Phytopathological Society. Part of one day was spent at the Missouri Botanical Garden. He also was present at the biennial convention of the Honor Society of Phi Kappa Phi, by which his expenses were paid.

On Tuesday night, December 29, Dr. Ball attended the dinner of the Botanical Society of America, on Wednesday night that given by the American Phytopathological Society, and on Thursday night the Phi Kappa Phi dinner. At 6:15 on Thursday evening he broadcasted the Story of the Common Barberry and Black Stem Rust from Station WDAF, Kansas City Star.

In general, the programs of the various sections of affiliated societies were splendidly organized and conducted. The meetings visited by Dr. Ball seemed to be well attended and the quality of the papers was excellent.

Dr. Liberty Hyde Bailey was elected president of the American Association for the Advancement of Science for the ensuing year. Dr. B. M. Duggar, of the Missouri Botanical Garden, was elected chairman of Section G, Botany, and Dr. C. F. Marbut, of the Bureau of Soils of the U. S. Department of Agriculture, was elected chairman of Section O, Agriculture.

A. A. Bryan, assistant agronomist in the cooperative corn investigations at the Iowa State College, Ames, Ia., was granted the degree of Master of Science on December 18, by the Iowa State College.

Dr. H. B. Humphrey, senior pathologist in charge of rust investigations, left Washington on December 30 for points in Minnesota, South Dakota, Iowa, Indiana and Kentucky to confer with State and Federal investigators regarding studies and experiments in connection with rusts of cereals and manuscripts relating thereto. At Aberdeen, S. Dak., Dr. Humphrey will attend the meetings of the South Dakota Crop Improvement Association and present a paper on cereal diseases and their control. He will return to Washington January 13.

Dr. H. H. Love, of the department of plant breeding at Cornell University, who returned from China last fall, writes as follows to Dr. C. R. Ball on December 15:

"I have returned from my six and a half months spent in China in plant improvement work, looking toward famine prevention. This work, as you know, is done under a cooperative agreement between the International Education Board, the University of Nanking, and Cornell University. The past summer was spent in reorganizing the projects dealing with plant improvement work, in making plans for a large plant improvement program, and in enlisting the cooperation of many agencies in China. The crops used were wheat, barley, corn, soy beans, kaoliang, and rice. Large projects are planned with all these crops and many head, ear, and plant selections have been made with all of them. We have planted a very large wheat nursery this fall on the farm of the University of Nanking and at several other places. These cooperating stations are located in different parts of China and give us opportunity to study our selections under different environmental conditions. The plantings we have made are indicated in the following table:

Station	Rod Rows	Head Rows	Foreign Varieties
Nanking	1,927	6,322	465
Kaifeng	1,233	2,360	345
Nanhsuchow	153	1,198	340
Yihsien	658	2,016	
Weihsien	243	1,084	
Wuchang	128	1,244	
Wusih	228		
	4,848	14,224	1,150

Grand total of rows - 20,222

In addition to these we have over 2,400 head rows of barley selections. In all this plant improvement work we are cooperating very closely with Mr. R. H. Porter, the pathologist, and, in fact, several of our projects are written as joint projects.

"For the work next year we have over 1,200 individual selections of kaoliang, and seed of each selection will be planted at three or more of our cooperating stations, so that the same selection may be observed under different environmental conditions. We also shall have probably 3,000 individual plant selections of soy beans for testing at two or more stations. Owing to the fact that we were able to obtain the hearty cooperation of a number of the various agencies it makes it possible to carry the work along on a much larger scale than if all of it were done at one place.

"I feel that the time spent in China is well worth while and am certain that by the introduction of our American methods much good will result, provided we are able to continue the work without interruption. This I believe we can do."

Dr. W. H. Tisdale, pathologist in charge of cereal-smut investigations, came to Washington from Yonkers, N. Y., on December 29 to inspect the cereal-smut experiments in the laboratory and greenhouses at Arlington Farm and to discuss with Mr. F. A. Coffman the preparation of a joint manuscript on corn smut experiments at Akron, Colo., and with other members of the Office concerning future plans for the cereal-smut project. On December 30 Dr. Tisdale gave a brief talk in the cereal-disease laboratory on the work of the Boyce-Thompson Institute, at Yonkers, N. Y., where he is temporarily stationed. He returned to Yonkers on December 31.

The appointment of Roy A. Weaver, agent in the cereal-disease investigations conducted at La Fayette, Ind., in cooperation with the Purdue University Agricultural Experiment Station, was terminated December 31. In accordance with cooperative arrangement, Mr. Weaver's salary will be paid by the Station beginning January 1, 1926.

VISITORS

Mr. F. deV. Joyce, of Kilima Kiu, Ulu, Kenya Colony, East Africa, was an Office visitor on December 22. Mr. Joyce is engaged in wheat and dairy farming at an altitude of about 6,000 feet. He has nearly 500 acres under cultivation and a large area of tall-grass savannah is used for native pasture.

In Kenya Colony there are two rainy periods. The heaviest rains occur in April and May and in November and December there is a period of lighter rainfall. Temperatures are very equable throughout the year, never falling below 50 degrees F. and seldom rising above 75 or 80 degrees F.

Most of the wheat is sown in the latter part of March and a smaller area about October 20. One of the difficulties of wheat growing is the control of weeds. Mr. Joyce grows about 150 acres of corn annually for silage. Pit silos are used exclusively. Better grain-producing varieties are needed.

Hon. C. F. Lea, Representative in Congress from the First District of California, called at the Office on December 18 in the interests of rice investigations in California.

MANUSCRIPTS AND PUBLICATIONS

77 A manuscript, entitled "Breeding Wheat for higher Protein Content," by J. Allen Clark, was approved December 23, for publication in the Journal of the American Society of Agronomy.

78 A manuscript, entitled "Hybrid Vigor in Rice," by J. W. Jones, was approved December 23 for publication in the Journal of the American Society of Agronomy.

79 A manuscript, entitled "Growth of Mung Beans on Submerged Land," by J. W. Jones, was approved December 23, for publication in the Journal of the American Society of Agronomy.

80 A manuscript, entitled "Relation of the Seed Coat of Feterita to the Rate of Water Absorption, and Germination," by A. F. Swanson, was approved December 23 for publication in the Journal of the American Society of Agronomy.

Galley proof of article, entitled "The Pasmo Disease of Flax," by W. E. Brentzel, for publication in the Journal of Agricultural Research, was read December 28.

Page proof of article, entitled "A Concentration Gradient in Corn Stalks," by A. M. Hurd-Karrer, for publication in the Journal of General Physiology was read December 29.

Department Bulletin 1354, entitled "Tests of Barley Varieties in America," by Harry V. Harlan, Mary L. Martini, and Merritt N. Pope, was received from the Government Printing Office on December 17, bearing date of November, 1925.

Department Bulletin 1347, entitled "Foot-Rot Diseases of Wheat in America," by Harold H. McKinney, was received from the Government Printing Office December 29 bearing date of November, 1925. (In cooperation with the Illinois, Kansas, North Carolina, Oregon, Washington and Wisconsin agricultural experiment stations.)

An article, entitled "Resistance to Covered Smut in Varieties and Hybrids of Oats," by E. F. Gaines, appears in the Journal of the American Society of Agronomy, vol. 17, no. 12, p. 775-789. December, 1925. (The investigations on which the data are based were conducted cooperatively by the Washington Agricultural Experiment Station and the Office of Cereal Investigations.)

The article, entitled "Comment on Developing a High-Yielding Strain of Corn," by Frederick D. Richey, appears in the Journal of the American Society of Agronomy, v. 17, no. 12, p. 804-807. December, 1925.

Department Bulletin 1354, entitled "The Productiveness of Successive Generations of Self-Fertilized Lines of Corn and of Crosses between Them," by Frederick D. Richey and L. S. Mayer, was received December 31 from the Government Printing Office, bearing date of December, 1925. (In cooperation with the Tennessee Agricultural Experiment Station.)

January 1, 1926

TO MEMBERS OF THE OFFICE STAFF

Another old year has ended and a new year has begun. The years may seem to be very much alike but there always are points of progress in each year.

1925 was the year in which the working of the new Reclassification Law became completely effective. This law, while doubtless not perfect, is an improvement over any previous legislation and already has been helpful to the staff in several distinct ways. In the first place, it has given a definite basis for comparison of work and of workers. In the second place, it has added the temporary Congressional bonus permanently to the salaries. In the third place, it has increased many salaries and has provided a method for earned promotions in the clerical force. It is an earnest of the Government's desire to attract and to retain the best workers available. Shall we measure up to the requirement?

The year 1925 has further developed the spirit of comradeship, cooperation and team play in our work in Washington and in the field. It is easier to live to one's self alone. It is more pleasant and more profitable to work for the good of all. Those who do not do this miss one of the most important things in life. It is the spirit of the age. The world is being drawn closer together by mechanical genius in communication and transportation. It is drawing itself closer together in the things of the spirit, brotherhood and good will.

We are a little cosmos, a little world of our own, but a cross-section of the greater world. Shall we lead or follow or lag behind? It has been said that there is no standing still. One either moves forward or slips back. There can be but one choice. We welcome 1926 with its new opportunities in old duties.

C. R. Ball

PROJECT REPORTS

RUST INVESTIGATIONS

(Dr. H. B. Humphrey, Senior Pathologist in Charge)

PRELIMINARY REPORT ON LOCATIONS OF BUCKTHORN (RHAMNUS CATHARTICA) IN THE UPPER MISSISSIPPI VALLEY STATES IN 1925

By S. M. Dietz, Assistant Pathologist in Crown Rust Investigations

The following table presents a list of additional locations on buckthorn (Rhamnus cathartica) for 1925, together with the totals for 1923 and 1924. This work consists of a partial survey in eight Mississippi Valley States, conducted in cooperation with the State leaders of barberry eradication and their field assistants.

New Locations of Rhamnus cathartica during 1925

State	Number of Plantings			Number of bushes counted	Length of hedge in ft. Bushes not counted
	City	Country	Total		
Illinois	5	5	10	78	100
Iowa	6	7	13	1,787	
Minnesota	33	55	88	1,782	4,230
Montana	17	5	22	6,550	
Nebraska	4	1	5	75	250
North Dakota	1	3	4	135	500
Ohio	3	3	6	40	
Wisconsin		10	10	610	300
Total, 1925	69	89	158	11,057	5,380
Total, 1924	122	113	235	8,961	11,837
Total, 1923	617	169	786	84,080	32,508
Grand total	808	371	1,179	104,098	49,775

REPORT OF PROGRESS IN BARBERRY ERADICATION FOR THE CALENDAR YEAR ENDED DECEMBER 31, 1925

By Dr. F. E. Kempton, Associate Pathologist in Charge, and
Lynn D. Hutton, Associate Pathologist

The barberry eradication campaign has been carried on for eight years. Its purpose is to reduce stem-rust losses of small grains by eradicating all susceptible barberry bushes from the north-central, wheat-growing States of the upper Mississippi Valley.

This campaign is conducted cooperatively with Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin and Wyoming. The Conference for the Prevention of Grain Rust, of Minneapolis, Minn., composed of representatives of agricultural and allied interests, and a number of State and local agricultural and interested organizations likewise cooperate closely.

Very close cooperation of property owners also has been obtained through contacts by the men in the States and by publicity and educational activities. The latter have included Federal and State bulletins and circulars, exhibition and extension materials, and educational demonstrations.

A State leader is in charge in each State. In connection with the supervision of the campaign he makes contacts with the cooperating agencies. Under the general direction of the national leaders he supervises the following four phases of the campaign: (1) investigations, (2) educational activities, (3) surveys, and (4) eradication.

INVESTIGATIONS

The investigations undertaken have included: (1) stem-rust epidemiology studies, (2) classification of Berberis and other closely related genera, (3) testing of the susceptibility to stem rust of species, varieties, hybrids and strains of Berberis and related genera, and (4) chemical studies in connection with the problem of eradication.

Stem-Rust Epidemiology Studies

Leaders and field agents in barberry eradication have taken a very active part in these cooperative studies in connection with stem-rust investigations. These studies were conducted in the 13 States of the eradication area, as well as in Texas, Oklahoma, Kansas, Missouri, and other important grain-growing States. The results of this year's activities have been summarized in an article, entitled "Summary of the Epidemiology Situation for the Season of 1925," by E. C. Stakman, R. B. Lambert and J. J. Christensen, in the Cereal Courier, vol. 17, no. 27, 359-365, October 31, 1925. The following is a short statement of the possible sources of stem rust as taken from that article:

"There are three possible sources of stem rust in the hard red spring-wheat region: (1) summer spores which may have overwintered on volunteer grains, fall-sown grains, or wild grasses; (2) summer spores which may have overwintered in Texas or Mexico and which may have been blown northward by the wind; (3) the common barberry.

"1. The first source was practically negligible in 1925, as well as in previous years. Experiments on overwintering were made again in the winter of 1924-25; the results confirm those of previous years. The uredinial stage does not overwinter commonly in the barberry eradication area, although there is some circumstantial evidence and a little direct evidence that urediniospores sometimes overwinter in sheltered locations. There is evidence that this overwintering has occurred to a slight extent in Wisconsin, Colorado, Wyoming, and, perhaps, southern Illinois.

"2. There is circumstantial evidence that the initial infection of grain fields in the spring-wheat area may be due to urediniospores from the south, but in an average season this rust usually is too late to do much damage. In 1917 and 1918 there was no evidence of infection from urediniospores of southern origin. Evidently inoculum from this source was of little importance in 1922 and 1924. In 1919, 1920, 1921, and 1923, however, there was some evidence that a certain amount may have been initiated by southern spores carried northward on the wind. In 1925 considerable rust probably developed from such urediniospores.

"3. Barberries again caused local epidemics and, possibly, regional ones. The question still remains as to the relative responsibility of spores blown from the south and those from the barberry. It can not be answered categorically, because no two seasons are exactly alike."

Classification of Berberis and other Related Genera

A collection of Berberis is being grown at Bell, Maryland. This collection now numbers 106 known species, varieties, and hybrids, of which 54 have been added in the past calendar year. Seeds were collected last year at the Arnold Arboretum, Jamaica Plains, Mass., and Highland Park, Rochester, N. Y.

The propagation of plants for the determination of their susceptibility has been confined to the caring for the stock propagated last year, the growing of the seedlings mentioned, and the preparation of winter cuttings for use next year. Propagation material has been procured from only part of the plants purchased as they have not made sufficient growth to warrant pruning.

Part of the literature on the classification of Berberis and related genera has been translated by B. Y. Morrison. The translation of Schneider's preliminary monograph appearing in the bulletin de L'Herbier Boissier, Series 2, vol. 5, and that of Schneider's article, entitled "Weitere Beiträge zur Kenntnis der Chinesischen Arten der Gattung Berberis (Euberberis)," in the Osterreichische Botanische Zeitschrift Vol. LXVII, No. 1 and following, have been completed.

This year Berberis plants were inspected in the parks of Cincinnati, Ohio, in a field of red-leaved, thunbergii-like barberries at Riverton, N. J., in a small collection of evergreen Berberis at Westbury, L. I.; and collections were made in New Mexico, Arizona, California, and Oregon.

Susceptibility of Berberis and Related Genera to Stem Rust

In the spring and early summer of 1925, 50 species, varieties, and hybrids of Berberis were inoculated with Puccinia graminis secalis. Of these Berberis eight were unnamed varieties from the gardens at Bell, Md. Seven species or varieties which had never before been known to become infected produced both aecia and pycnia. Three other varieties, including two varieties of Mahonia, produced pycnia only. The remaining 40 did not become infected. Additional tests will be made of those that did not rust in the first tests. The complete list will appear in the Cereal Courier at an early date.

The investigation of the correlation between morphological characteristics of Berberis spp. and reaction to stem rust was continued, and confirmatory results were obtained.

Chemical Studies

Chemical studies to ascertain the most effective methods of eradicating the common barberry were begun in September, 1921. Fully adequate methods of eradication with chemicals having been developed, these investigations were discontinued at the end of the fiscal year, 1925. Thirty-seven chemicals were tested under laboratory and field conditions. Several were satisfactory. A manuscript, entitled "Methods of Eradicating the Common Barberry (Berberis vulgaris L.)," has been submitted for publication. It was demonstrated that both common crushed rock salt and kerosene were easily obtainable, satisfactory to handle, and 100 per cent effective for killing barberries if properly applied. The cost of these chemicals and their application is considerably less than the cost of eradicating by digging. Both chemicals are being used according to the methods worked out in the chemical studies. U. S. Dept. Circ. 268, "Kill the Common Barberry with Chemicals," and U. S. Dept. Circ. 336, "Chemical Eradication of the Common Barberry," by Noel F. Thompson; U. S. Dept. Circ. 356, "The Common Barberry and How to Kill It," by F. E. Kempton and Noel F. Thompson; and numerous newspaper articles have been distributed advising how to eradicate barberries with either salt or kerosene.

Other studies also have included the effects of sodium arsenite when used to kill the common barberry. The results were published by E. R. Schulz and Noel F. Thompson, in U. S. Dept. Agr. Bul. 1316, entitled "Some Effects of Sodium Arsenite When Used to Kill the Common Barberry." The summary of this publication is as follows:

> "A modified volumetric method for the determination of small quantities of arsenic in plant tissue was developed and proved to be rapid and accurate. Sodium arsenite in proper dilution was an effective killing solution for most plants. The arsenious acid was the most effective form of arsenic tested. Arsenic was found in nearly all tissues of treated plants, while the controls contained no arsenic. Arsenic was most effective in killing plants when applied to the roots. Spraying or dipping was not always effective. The soils used showed rapid leaching of sodium arsenite where rainfall was abundant. The characteristic brackish sweet taste of arsenic attracted animals, and it was found that the use of sodium-arsenite solution in pastures without precautions or repellants was not safe."

The relation of the seasonal storage of reserve food products in different parts of the barberry plant to the time of year for effective treating with chemicals was investigated. In addition, investigations of the sterilizing effects of chemicals on soil; the effects of salt when used to kill the common barberry; and the analysis of barberry tissues for alkaloids and glucosides with methods for their extraction have been completed. The following additional manuscripts and publications have been prepared or published:

Berberine in the Common Barberry, by E. R. Schulz. Approved July 9, 1925, for publication in the Journal of the American Pharmaceutical Association.

Chemical Composition of Etiolated and Green Barberry Sprouts and Their Respective Roots, by E. R. Schulz and N. F. Thompson. Approved July 1, 1925, for publication in the Botanical Gazette.

Effects of the Method of Desiccation on the Nitrogenous Constituents of Plant Tissue, by K. P. Link and E. R. Schulz. In Jour. Amer. Chem. Soc. 46: 2044-2050. September, 1924.

The Extraction of Nitrogenous Constituents from Plant Cells, by W. E. Tottingham, E. R. Schulz and S. Lepkovsky. In Jour. Amer. Chem. Soc. 46: 203-208. January, 1924.

EDUCATIONAL ACTIVITIES

The relation of the common barberry to stem-rust spreads, the small-grain losses caused by stem rust, the ways of identifying the common barberry, and the proper methods of its eradication have been emphasized in publications, window demonstrations, booths at State and county fairs, and at other agricultural meetings and shows. Radio talks have been given on stem rust and barberry eradication. About 400,000 Federal bulletins and circulars and thousands of State bulletins were either mailed to property owners or handed to them personally as the survey progressed.

The State leaders are reaching large groups of school children each year by furnishing lesson plans and materials to teachers of high school botany, agriculture, and vocational education, and to hundreds of teachers of rural schools. Panels demonstrating the relation of infected barberries to stem-rust losses, the characteristics of the harmful barberry, places where it may be found, and methods of its eradication are circulated to schools, banks, county agents' offices, and farmers' meetings. A special effort is made by field men to make friends for the campaign by explaining its purpose to as many people as possible, enlisting at least one new friend a day for barberry eradication. Eradicated barberry bushes sometimes are placed in public squares so that property owners may become familiar with the characteristics of these bushes. Property owners are notified of the purpose of the survey and the approximate date of beginning survey in each county. This is done by means of news articles in local papers, circular letters, and cards which also give information in regard to local barberries and stem rust.

The Conference for the Prevention of Grain Rust, already mentioned, cooperates closely in this phase of the campaign. This organization disseminates reliable information on the cause of black-stem rust and methods for its control. Popular support for the barberry-eradication campaign is thus obtained. Conference representatives work in close cooperation with the Federal and State forces. In the summer of 1925 this organization placed special emphasis on local newspaper publicity in the areas where the Federal forces were at work. The barberry field men were supplied with demonstration material and moving picture films. In some instances a representative of the Conference aided in giving demonstrations.

In the winter the Conference cooperates with the State leaders by acting as a clearing house for information as to the best methods of interesting the school children in barberry eradication as a means of stem-rust control. It supplies pressed barberry samples, rusted straw and shriveled grain, circulars, colored plates, a lesson plan, a colored post card, and other materials and services not readily furnished through official channels. In addition to other activities the Conference has arranged, and extensively advertised, several radio talks. It has sponsored numerous meetings of business men at which the relation of stem rust to barberries was discussed.

The State extension divisions of the colleges of agriculture cooperate closely by sending special information on barberry eradication to county agricultural agents and disseminating information to farmers about stem rust and stem-rust control. The State experiment stations and the State departments of agriculture furnish information through various sources as to small-grain production and losses from stem rust. These State organizations also aid by furnishing funds, office space, heat, light, and other services for barberry eradication. The value of the indirect aid and funds furnished for barberry eradication by State and other cooperating organizations for the fiscal year begun July 1, 1925, totaled approximately $85,000.

SURVEYS

Original Survey

There are three types of survey in progress, original survey, second survey, and resurvey. The first named is a property-by-property survey in cities, towns, and villages and a farm-to-farm survey of all the rural properties in the area. The original survey of Colorado, Wyoming, Nebraska, South Dakota, North Dakota, Iowa, Minnesota, Wisconsin, and Indiana, was nearly completed prior to 1925. In 1925, 56.94 counties were included in original survey. These were as follows: Ohio, 3.85 counties; Michigan, 9 counties; Illinois, 26.6 counties; Montana, 15.2 counties; Minnesota, 1.87 counties; and parts of a few counties in other States. This nearly completes the original survey as only about 60 counties remain. Of these 30 are in Illinois, 10 in Michigan, 5 in Montana, and 15 in Ohio. Nearly half of these counties, however, are known to have many bushes and are difficult to survey.

Second Survey

A second survey is one in which every foot of rural and city property on which barberries may possibly be growing is examined. This thorough survey is absolutely essential to accomplish the object of the campaign, namely, the location of all barberry bushes, including escaped bushes and seedlings missed on the first survey. Many bushes cut down early in the campaign have grown again. Bushes and seedlings growing among weeds and shrubbery and in other out-of-the-way places often are overlooked. It apparently will be necessary to make a second survey of nearly all the counties in which many fruiting bushes have been found. In 1925 the second survey was conducted in 56.12 counties. In these counties in 10 States, 55,485 bushes were found on 1,092 properties, and 20,173 seedlings were found on 116 properties. This is an average of about 20 properties of 990 bushes for each county. In addition, there was an average of 360 seedlings per county.

In all, 167.31 counties have been covered by a second survey. In these counties 2,095 properties having 65,591 bushes, and 170 properties with 29,752 seedlings were located. As stated previously, these bushes were for the most part either those cut off earlier in the campaign or those so located that they were previously overlooked. A majority of the large plantings of barberries which were missed on the original survey were groups of escaped bushes in woodlands that had spread from cultivation. The original bushes or hedges, in most of these cases, had been removed so long ago that the present property owners did not know of the existence of the escaped barberries in the woodlands. Most of the seedlings found had developed since the fruiting bushes were removed. This second survey has shown that not all bushes can be found on a single survey and that other surveys may be needed to get all bushes. The relative efficiency of the first survey, in terms of the second is 92 bushes found on the first survey to 8 on the second. However, in every county covered there were found more than enough missed bushes to serve as sources for severe rust epidemics.

Resurvey

A resurvey is a reinspection of the properties on which barberries have previously been found and eradicated. Two years after the bushes are eradicated the properties are reinspected, and sprouts and seedlings are removed or treated with chemicals. Other reinspections are made as seem necessary. These reinspections are essential for complete eradication and are necessary to prevent sprouts and seedlings becoming infected and starting stem-rust epidemics. Seedlings are very difficult to locate and new seedlings may continue to appear for a number of years after the removal of fruiting bushes. In 1925, 17,036 sprouting bushes were found on 1,733 properties and 365,734 seedlings on 719 properties. Most of these were destroyed immediately.

ERADICATION

Methods

Eradication for the most part now is accomplished with chemicals. Either salt or kerosene is used. Digging is necessary when barberries are near valuable plants or trees that may be damaged by chemicals. Seedlings and small escaped barberry bushes in loose soil usually can be pulled easily but in rocky soil they must be treated with chemicals. The relative efficiency of chemicals over digging is shown by the fact that few sprouts are found where chemicals have been applied properly. In 1925, more than 327 tons of salt and 5,030 gallons of kerosene were used to kill barberries. The size of the task of eradication is better understood when one realizes that in all, more than 2,246,000 pounds of salt, 20,041 gallons of kerosene, and 1,056 gallons of sodium arsenite solution have been applied to barberries. The salt alone amounts to nearly 60 carloads.

All bushes, sprouting bushes, and seedlings found in Illinois, Minnesota, North Dakota, and South Dakota, have been destroyed. In the other States, eradication is accomplished as rapidly as conditions permit. In all, there have been eradicated 11,556,209 of the 12,100,486 bushes, sprouting bushes and seedlings found. Most of those not yet eradicated are in a few large areas of escaped bushes.

Seedlings

Seedlings are a special problem. They not only may be scattered among weeds, grass and shrubbery where a most careful search will not reveal them, but new seedlings have continued to appear in some areas for from five to seven years after all fruiting bushes have been destroyed. To find and eradicate seedlings is very difficult in that they often are scattered very thickly in rocky ledges, entwined with the roots of shrubs and trees, and in pastures and fields among grasses and weeds. Two and even three successive inspections may fail to reveal every seedling. As time must be given for the seeds to germinate and the seedlings to develop to a size easily located, numerous careful inspections must be made at intervals of two or more years. However, in the meantime these small seedlings may become infected and spread stem rust and continue to be a menace to grain-growing. Each area from which either hedges, single old fruiting bushes, or escaped bushes have been eradicated must be reinspected regularly for seedlings for a number of years.

Escaped Barberries

Areas of escaped barberries are much more numerous than was expected in the earlier days of the campaign. To December 31, 1925, nearly four millions of escaped barberries have been found and eradicated. Even with the finding of these millions of escaped bushes, sufficient care was not taken in searching all woodlands, fence rows, pasture lands, stream banks, rocky cliffs, and lake shores for escaped bushes. Often a search was made for a distance of two or three miles in each direction from old hedges but the extreme outskirts of the spread were not reached in many cases.

Careful foot-by-foot surveys over a wide area for escaped bushes are necessary about each location of bushes old enough to have borne seeds. If any fruiting escaped bushes are found distant from the original planting, the circle must be widened until no bushes can be found.

In some cases this has led to the foot-by-foot survey of very large areas. In Dane County, Wisconsin, one such spread has taken in over 240 square miles with escaped bushes and seedlings on almost every farm in this area. Four men have been working in this area about four months each summer for four years. The extreme limits are not yet reached. Eradication of bushes has kept pace with the surveys in this area, but seedlings will continue to appear for a number of years. In Manistee County, Michigan, a small hedge near the little station of Marillo, was responsible for the spread of bushes to an area of over 42 square miles, all of which had to be covered on foot. Much timber and undergrowth made the task difficult.

In northeastern Nebraska along the Missouri River, in Cedar County, a hedge of barberries half a mile long became a center from which bushes were spread. These were found scattered to the surrounding woodlands and ravines, cliffs, and heavily wooded lowlands along the Missouri River. The survey and eradication of bushes from this area took eight men over 90 days.

There are hundreds of these areas of escaped bushes that must be dealt with as special problems. Special resurveys of the areas are necessary at intervals of at least two years until each area is free of bushes and seedlings.

In all surveys, 3,975,791 bushes have been found escaped from cultivation on 6,398 properties. Most of these have developed in less than 40 years, many in 20 years. Just how many barberries would have developed in 40 more years if all of the barberries had been allowed to remain and seed the woodlands, fence rows, and stream banks can not be estimated. A single infected barberry bush has been known to cause a local loss to wheat growers; in one township in one year more than 10,000 bushels of grain were destroyed. The losses that the millions of planted barberries and their other millions of progeny would have caused in a few years if none had been eradicated would have made small-grain production unprofitable and in many places impossible. The problem of escaped barberries has been attacked none too soon. Much patience and labor and large quantities of chemicals are needed to clear many of these areas of all bushes, seedlings, and sprouts.

In the spring and early summer of 1925 a special survey was made of the greater part of Jackson County, Iowa, to check the efficiency of the methods used in second survey. The cities and towns of this county had been surveyed in 1919. A farm-to-farm survey had followed in 1922. A second survey using the same methods as in the original farm-to-farm survey had been made in 1923. This county was then chosen for a check survey because it contained about an equal portion of level farming area with little timber, broken wooded river bluffs, and lowlands area. The results showed that the farm-to-farm survey method used on original survey was insufficient and that a foot-by-foot survey must be made of all shrubbery about buildings, all lawn plantings, wind breaks, fence rows, woodlands, pastures, stream banks, ravines, all shores of lakes and ponds, and all rocky bluffs. Even then some bushes and seedlings may be missed. The results also showed conclusively that every area of escaped barberries must be carefully surveyed and mapped and that, in addition, a foot-by-foot survey must be made over a wider area about each area of escapes to make sure that the outer margin is reached.

DISCUSSION

This year's results show that a great many barberry bushes are still in existence in the barberry-eradication area. Some of these bushes are in areas not yet reached in survey and eradication, for barberries are known to be numerous in the old established farming communities of the counties not yet covered in the first survey. Others are bushes overlooked in surveys. Those causing the greatest concern, however, are the bushes overlooked in the course of previous surveys. The second-survey results show that a comparatively large number of plantings were missed on the first survey. These are scattered well over the entire area. In spite of the extreme care used in the second survey a check survey in a county picked for the purpose showed that a comparatively large number of barberries may be missed even on second survey unless every foot of the area is inspected. All areas of escaped bushes must be completely inspected, and care must be exercised to insure that the extreme limits of these areas are reached. Numerous seedlings may continue to develop each season in the vicinity of locations from which fruiting busnes were removed. The missed bushes and the continuously developing seedlings are hidden centers of stem-rust infection. Patience in searching for bushes and seedlings, the following up of all reports of the early and heavy development of stem rust in local areas, and the eradication of bushes found will aid materially in the control of stem rust.

In the eastern winter-wheat producing States of the eradication area stem rust of wheat is controlled as soon as the barberries are eradicated from an area.

It may be that stem rust developing early in southern climates under certain conditions is spread widely by winds to the spring-wheat producing States. However, in 1925 142,550 barberry bushes and 701,796 seedlings were found in the counties surveyed. In the second survey in Minnesota, 1,124 bushes were found on 134 properties in about 10 counties. In North Dakota, 110 bushes were found on 15 properties in 5.65 counties. In South Dakota 446 bushes were located on 66 properties in 10,48 counties, and in Iowa, 1,125 bushes on 145 properties in 8 counties. Similar numbers resulted from this survey in the other States. Granted that much rust may develop from untraced sources, it is nevertheless true that wherever very severe local stem rust epidemics have continued to recur year after year a careful survey usually reveals one or more plantings of barberries. Records of hundreds of these epidemics are filed in the offices of State officials, and many cases of the reduction of rust by eradication of local barberries are testified to each year by farmers and field men.

Thousands of bushes and seedlings no doubt still exist in the 13 States of the eradication area. A preliminary survey of a few townships in border counties in Kansas and Missouri in 1924, and a further check for stem rust in the spring of 1925, show that many plantings of barberries exist there. Some of these when examined were spreading stem rust to grains and grasses, others apparently were not.

There are eradication laws or regulations under which barberry bushes may be eradicated not only in the 13 States of the eradication area, but also in Missouri, Oregon, Washington, West Virginia, and Tennessee. Interest in the eradication of barberries locally is manifested in Pennsylvania. In the part of Virginia where B. canadensis, a native barberry, spreads stem rust to local grain crops local eradication of this native barberry is in progress. North Carolina scientists are showing interest in the spread of stem rust from B. canadensis in that State.

It is evident that barberry eradication is a material aid in the solution of the stem-rust problem. Stem rust apparently has been affecting grain in different parts of the world for ages and it will no doubt continue to be a problem for years to come. All available data seem to indicate that the most severe stem-rust losses have been in areas badly infested by barberries.

No one can question that if the more than 11,500,000 harmful barberry bushes, seedlings, and sprouts already destroyed had been allowed to continue to grow in grain-producing areas of the United States the grain crop would have been many times more severely jeopardized every year than with these centers of infection eradicated. It is highly probable that if these millions of bushes had been allowed to fruit and spread seeds producing other millions of bushes in a few years no grain could have been grown in the great grain producing area of the upper Mississippi Valley and the adjacent provinces of Canada.

This campaign of eradication must be carried to its logical conclusion. The eradication of every barberry bush from the grain-producing areas is necessary as the most immediately available and practical means of reducing the stem-rust menace to a minimum.

SUMMARIZED RESULTS

Summary for 1925

During the calendar year 1925, approximately 57 counties were covered in original survey and approximately 56 counties were surveyed a second time. In continuing the resurvey, about 160 counties were covered. Original bushes numbering 142,550 were found on 3,985 properties, and 149,822 bushes were destroyed on 4,119 properties. These totals include 55,485 bushes found on 1,092 properties in second survey. In resurvey, 17,036 sprouting bushes were found and 17,141 were eradicated. Seedlings numbering 701,796 were found in original survey, second survey, and resurvey. These data are summarized in tables 1, 2, 5, 6, 9, 10, 13 and 15.

Summary of Results for Eight Years

In the eight years of the campaign, from April 1, 1918, to December 31, 1925, an area equivalent to approximately 643 counties has been covered in the original farm-to-farm survey. The original survey of nearly all cities in the entire 13 States has been completed. Of the counties already covered by the original survey approximately 167 have been surveyed a second time. In continuing the resurvey it has been necessary to revisit the properties in approximately all counties covered by the original survey to June 30, 1924. Original bushes numbering 6,500,693 have been located on 72,450 properties. Of these 5,963,014 bushes have been destroyed on 71,629 properties. In resurvey 290,655 sprouting bushes were found on 12,653 properties and 289,734 sprouting bushes were destroyed from 12,643 properties. In all surveys, 5,303,938 seedlings were found, and 5,303,461 were destroyed. These numbers include 65,591 bushes and 29,752 seedlings found, and 65,535 bushes and 29,751 seedlings destroyed on second survey. This makes a grand total of 12,100,486 bushes, sprouting bushes, and seedlings found, and 11,556,209 bushes, sprouting bushes, and seedlings destroyed in all surveys in the entire campaign. These data are summarized in tables 3, 4, 7, 8, 11, 12 and 17.

ORIGINAL SURVEY, PROPERTIES, 1925

Table 1.

Data showing, by States, the number of properties on which barberry bushes were found and destroyed in all surveys, and the number of properties upon which seedlings were found and destroyed in the original and second surveys, January 1 to December 31, 1925

State	Number of counties covered in original survey	Number of properties on which bushes were found: In cities and towns	In country: Having escaped bushes	In country: Total	Total number of properties cleared of bushes: Total in cities and country	Dug	Treated	Total	Number of properties on which seedlings were Destroyed: Found	Dug	Treated	Total
Colorado	0:	2:	3:	5:	7:	3:	4:	7:	0:	0:	0:	0
Illinois	26.60:	836:	89:	488:	1,324:	1,051:	319:	1,370:	72:	65:	7:	72
Indiana	0:	77:	63:	115:	192:	95:	93:	188:	13:	5:	8:	13
Iowa	0:	41:	86:	142:	183:	65:	117:	182:	22:	2:	20:	22
Michigan	9.00:	45:	247:	294:	339:	93:	258:	351:	102:	88:	14:	102
Minnesota	1.67:	26:	50:	142:	168:	66:	102:	168:	18:	8:	10:	18
Montana	15.20:	14:	9:	23:	37:	25:	10:	35:	8:	6:	2:	8
Nebraska	.50:	3:	38:	64:	67:	7:	54:	61:	8:	6:	1:	7
North Dakota	0:	14:	0:	16:	30:	13:	17:	30:	0:	0:	0:	0
Ohio	3.85:	322:	547:	800:	1,122:	522:	641:	1,163:	172:	29:	139:	168
South Dakota	0:	4:	12:	73:	77:	14:	63:	77:	3:	3:	0:	3
Wisconsin	0:	119:	231:	318:	437:	262:	222:	484:	48:	39:	14:	53
Wyoming	.12:	1:	0:	1:	2:	2:	1:	3:	0:	0:	0:	0
Total	56.94:	1,504:	1,375:	2,481:	3,985:	2,218:	1,901:	4,119:	466:	251:	215:	466

ORIGINAL SURVEY; BUSHES AND SEEDLINGS, 1925

Table 2.

Data showing, by States, the number of barberry bushes found and destroyed in all surveys, and the number of seedlings found and destroyed in the original and second surveys, January 1 to December 31, 1925

State	Number of bushes found				Number of bushes destroyed			Number of seedlings			
		In country							Destroyed		
	In cities and towns	Escaped	Total	Total	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	4	16	80	84	75	16	91	0	0	0	0
Illinois	5,814	46,386	80,891	86,405	19,759	42,832	62,591	8,341	4,135	4,206	8,341
Indiana	250	1,139	1,365	1,615	290	1,336	1,626	1,654	230	1,424	1,654
Iowa	129	1,259	1,842	1,971	358	1,611	1,969	3,703	1,005	2,698	3,703
Michigan	157	14,301	14,729	14,886	1,716	13,494	15,210	156,052	151,220	4,832	156,052
Minnesota	131	766	1,601	1,732	374	1,358	1,732	2,026	153	1,873	2,026
Montana	29	932	1,072	1,101	480	439	919	2,950	1,855	1,095	2,950
Nebraska	4	715	1,239	1,243	221	994	1,215	2,445	1,935	509	2,444
North Dakota	76	0	191	269	74	195	269	0	0	0	0
Ohio	3,011	25,986	28,058	31,069	5,344	24,890	30,234	147,650	9,510	136,950	146,460
South Dakota	16	151	655	671	361	310	671	285	285	0	285
Wisconsin	390	30,761	31,080	31,470	8,872	24,384	33,256	10,956	13,476	1,380	14,856
Wyoming	1	0	33	34	6	33	39	0	0	0	0
Total	9,714	122,462	132,836	142,550	37,930	111,892	149,822	336,062	183,804	154,967	338,771

ORIGINAL SURVEY, PROPERTIES, 1918 - 1925

Table 3.

Data showing, by States, the number of properties upon which barberry bushes were found and destroyed in all surveys, and the number of properties upon which seedlings were found and destroyed in the original and second surveys, April 1, 1918, to December 31, 1925

State	Number of counties covered by original survey	Number of properties on which bushes were found: In cities and towns	In country: Having escaped bushes	In country: Total	Total in cities and country	Total number of properties cleared of bushes: Dug	Treated	Total	Number of properties on which seedlings were destroyed: Found	Dug	Treated	Total
Colorado	31.49	1,546	60	167	1,713	1,647	63	1,710	0	0	0	0
Illinois	69.85	10,623	1,060	2,924	13,547	12,146	1,401	13,547	193	147	46	193
Indiana	92.00	3,613	341	1,253	4,866	4,404	441	4,845	46	22	24	46
Iowa	99.00	7,050	763	2,695	9,745	9,031	712	9,743	61	25	36	61
Michigan	61.30	5,085	1,779	5,431	10,516	8,985	856	9,841	477	416	61	477
Minnesota	87.00	3,163	503	2,023	5,186	4,916	270	5,186	379	350	29	379
Montana	36.33	200	19	95	295	257	35	292	10	7	3	10
Nebraska	93.00	3,194	125	741	3,935	3,659	260	3,919	24	9	14	23
North Dakota	53.00	535	1	330	865	764	101	865	2	1	1	2
Ohio	71.85	7,734	366	2,848	10,582	9,564	969	10,533	193	41	148	189
South Dakota	69.00	490	120	622	1,112	807	305	1,112	91	84	7	91
Wisconsin	71.00	7,002	1,260	2,996	9,998	8,978	970	9,948	173	87	76	163
Wyoming	8.12	75	1	15	90	86	2	88	0	0	0	0
Total	842.94	50,310	6,898	22,140	72,480	65,244	6,385	71,629	1,649	1,189	445	1,634

ORIGINAL SURVEY, BUSHES AND SEEDLINGS, 1918 - 1925

Table 4.

Data showing, by States, the number of barberry bushes found and destroyed in all surveys, and the number of seedlings found and destroyed in the original and second surveys, April 1, 1918, to December 31, 1925

State	Number of bushes found				Number of bushes destroyed			Number of seedlings			
		In country							Destroyed		
	In cities and towns	Escaped	Total	Total	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	19,597	2,661	4,837	24,434	23,908	521	24,429	0	0	0	0
Illinois	112,386	173,468	216,570	328,956	180,897	148,059	328,956	1,538,775	20,893	1,517,882	1,538,775
Indiana	77,470	103,863	118,925	196,395	97,814	97,692	195,506	8,616	977	7,639	8,616
Iowa	649,408	59,343	144,439	793,847	773,480	20,361	793,841	6,717	1,735	4,982	6,717
Michigan	53,984	357,934	427,716	481,700	366,848	91,935	458,783	936,844	861,558	75,286	936,844
Minnesota	592,492	81,943	193,464	785,956	780,578	5,378	785,956	22,304	19,706	2,598	22,304
Montana	6,913	1,861	4,380	11,293	10,022	1,078	11,100	3,762	2,022	1,740	3,762
Nebraska	73,085	6,398	22,431	95,516	90,671	4,781	95,452	9,180	2,850	6,329	9,179
North Dakota	14,479	150	7,935	22,414	19,635	2,779	22,414	156	150	6	156
Ohio	218,115	55,975	74,027	292,142	246,164	40,565	286,729	168,251	9,786	157,275	167,061
South Dakota	23,670	20,878	36,141	59,811	49,011	10,800	59,811	17,543	16,864	679	17,543
Wisconsin	280,998	3,111,316	3,123,255	3,404,253	2,853,089	42,941	2,896,030	45,840	23,713	17,841	41,554
Wyoming	3,947	1	229	4,176	3,972	35	4,007	0	0	0	0
Total	2,126,544	3,975,791	4,374,349	6,500,893	5,496,089	466,925	5,963,014	2,757,988	960,254	1,792,257	2,752,511

SECOND SURVEY, PROPERTIES, 1925

Table 5.

Data showing, by States, the number of properties upon which barberry bushes and seedlings were found and destroyed on second survey in the barberry eradication campaign from January 1 to December 31, 1925

State	Number of counties surveyed	Number of properties on which bushes were found: In cities and towns	In country: Having escaped bushes	In country: Total	Total in cities and country	Total number of properties cleared of bushes: Dug	Treated	Total	Number of properties on which seedlings were Destroyed: Found	Dug	Treated	Total
Colorado	4.35	0	1	3	3	1	2	3	0	0	0	0
Illinois	.64	75	31	59	134	106	28	134	25	24	1	25
Indiana	3.05	53	3	35	88	61	22	83	4	2	2	4
Iowa	8.00	30	67	115	145	57	88	145	16	2	14	16
Michigan	.67	5	23	26	31	10	21	31	1	1	0	1
Minnesota	10.30	15	43	119	134	39	95	134	14	5	9	14
Montana	3.23	0	0	0	0	0	0	0	0	0	0	0
Nebraska	1.50	3	38	64	67	7	54	61	8	6	1	7
North Dakota	5.65	7	0	8	15	8	7	15	0	0	0	0
Ohio	0	0	0	0	0	0	0	0	0	0	0	0
South Dakota	10.48	2	11	64	66	13	53	66	3	3	0	3
Wisconsin	7.75	115	206	292	407	207	199	406	45	34	11	45
Wyoming	.50	1	0	1	2	1	1	2	0	0	0	0
Total	56.12	306	423	786	1,092	510	570	1,080	116	77	38	115

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SECOND SURVEY, BUSHES AND SEEDLINGS, 1925

Table 6.

Data showing, by States, the number of barberry bushes and seedlings found and destroyed on second survey in the barberry eradication campaign from January 1 to December 31, 1925

State	Number of bushes found				Number of bushes destroyed			Number of seedlings			
	In cities and towns	In country							Destroyed		
		Escaped	Total	Total	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	0	5	7	7	1	6	7	0	0	0	0
Illinois	455	45,154	45,795	46,250	5,867	40,383	46,250	2,552	2,227	325	2,552
Indiana	175	9	62	237	167	62	229	9	5	4	9
Iowa	72	590	1,053	1,125	312	814	1,126	1,987	1,005	982	1,987
Michigan	5	257	268	273	58	215	273	200	200	0	200
Minnesota	36	420	1,088	1,124	175	949	1,124	1,970	122	1,848	1,970
Montana	0	0	0	0	0	0	0	0	0	0	0
Nebraska	4	715	1,239	1,243	221	994	1,215	2,445	1,936	509	2,444
North Dakota	36	0	74	110	41	69	110	0	0	0	0
Ohio	0	0	0	0	0	0	0	0	0	0	0
South Dakota	2	138	444	446	209	237	446	285	285	0	285
Wisconsin	338	3,959	4,298	4,636	2,434	2,201	4,635	10,725	9,576	1,149	10,725
Wyoming	1	0	33	34	1	33	34	0	0	0	0
Total	1,124	51,247	54,361	55,489	9,486	45,963	55,449	20,173	15,355	4,817	20,172

SECOND SURVEY, PROPERTIES, 1922-1925

Table 7.

Data showing, by States, the number of properties upon which barberry bushes and seedlings were found and destroyed on second survey in the barberry eradication campaign from January 1, 1922, to December 31, 1925

State	Number of counties surveyed	Number of properties on which bushes were found: In cities and towns	In country: Having escaped bushes	In country: Total	Total in cities and country	Total number of properties cleared of bushes: Dug	Treated	Total	Number of properties on which seedlings were - Found	Destroyed: Dug	Treated	Total
Colorado	20.04	0	16	30	30	4	26	30	0	0	0	0
Illinois	.64	75	31	59	134	106	28	134	25	24	1	25
Indiana	7.15	119	5	55	174	129	40	169	4	2	2	4
Iowa	14.00	41	122	218	259	87	171	258	26	3	23	26
Michigan	3.00	49	38	75	124	78	46	124	4	4	0	4
Minnesota	40.25	65	89	319	384	166	218	384	35	11	24	35
Montana	8.73	0	0	1	1	1	0	1	0	0	0	0
Nebraska	15.50	48	63	180	228	53	167	220	17	8	8	16
North Dakota	26.05	17	0	58	75	19	56	75	1	0	1	1
Ohio	2.00	18	0	7	25	24	1	25	0	0	0	0
South Dakota	19.50	29	11	93	122	21	101	122	4	4	0	4
Wisconsin	9.95	159	261	378	537	267	269	536	54	39	15	54
Wyoming	.50	1	0	1	2	1	1	2	0	0	0	0
Total	167.31	621	636	1,474	2,095	956	1,124	2,080	170	95	74	169

SECOND SURVEY, BUSHES AND SEEDLINGS, 1922 - 1925

Table 3.

Data showing, by States, the number of barberry bushes and seedlings found and destroyed on second survey in the barberry eradication campaign from January 1, 1922, to December 31, 1925

State	Number of bushes found			Number of bushes destroyed			Number of seedlings			
	In cities and towns	In country						Destroyed		
		Escaped	Total	Total	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	0	48	82	82	7	75	82	0	0	0	0
Illinois	455	45,154	45,795	46,250	5,867	40,383	46,250	2,552	2,227	325	2,552
Indiana	372	24	147	519	379	132	511	9	5	4	9
Iowa	151	1,074	2,034	2,185	504	1,679	2,183	2,487	1,055	1,432	2,487
Michigan	96	339	438	534	262	272	534	240	240	0	240
Minnesota	354	1,198	3,529	3,883	1,647	2,236	3,883	2,681	422	2,259	2,681
Montana	0	0	1	1	1	0	1	0	0	0	0
Nebraska	472	1,057	2,918	3,390	764	2,581	3,345	3,430	2,450	979	3,429
North Dakota	100	0	1,428	1,528	100	1,428	1,528	3	0	3	3
Ohio	59	0	31	90	88	2	90	0	0	0	0
South Dakota	268	138	1,263	1,531	253	1,278	1,531	685	685	0	685
Wisconsin	521	4,611	5,043	5,564	2,584	2,979	5,563	17,665	13,216	4,449	17,665
Wyoming	1	0	33	34	1	33	34	0	0	0	0
Total	2,849	53,643	62,742	65,591	12,457	53,078	65,535	29,752	20,280	9,471	29,751

RESURVEY, PROPERTIES, 1925

Table 9.

Data showing, by States, the number of properties upon which sprouting bushes and seedlings were found and destroyed on resurvey in the barberry eradication campaign from January 1 to December 31, 1925

State	Number of properties on which sprouting bushes were found -				Total number of properties cleared of sprouting bushes			Number of properties on which seedlings were -			
		In country		Total in cities and country					Destroyed		
	In cities and towns	Having escaped bushes	Total		Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	5	15	19	24	1	23	24	11	1	10	11
Illinois	76	45	88	164	103	61	164	60	48	12	60
Indiana	11	15	25	36	20	16	36	14	8	6	14
Iowa	39	84	186	225	89	136	225	74	28	46	74
Michigan	0	4	6	6	0	6	6	2	2	0	2
Minnesota	26	42	105	131	79	52	131	33	22	11	33
Montana	13	2	7	20	15	5	20	7	6	1	7
Nebraska	6	4	35	41	7	34	41	5	1	4	5
North Dakota	43	0	32	75	6	69	75	1	0	1	1
Ohio	376	144	404	780	537	243	780	413	294	119	413
South Dakota	1	0	6	7	2	5	7	9	9	0	9
Wisconsin	41	98	167	208	70	146	216	89	59	31	90
Wyoming	11	0	5	16	13	3	16	1	1	0	1
Total	648	453	1,085	1,733	942	799	1,741	719	479	241	720

RESURVEY, SPROUTING BUSHES AND SEEDLINGS, 1925

Table 10.

Data showing, by States, the number of sprouting bushes and seedlings found and destroyed on resurvey in barberry eradication campaign from January 1 to December 31, 1925

State	Number of sprouting bushes found			Number of sprouting bushes destroyed			Number of seedlings			
	In cities and towns	In country						Destroyed		
		Escaped	Total	Total	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	16	110	166	182	5	177	182	954	1	953	954
Illinois	523	985	1,569	2,092	942	1,150	2,092	139,366	29,497	109,869	139,366
Indiana	14	68	97	111	53	58	111	228	33	195	228
Iowa	240	1,873	2,826	3,066	404	2,662	3,066	11,202	1,172	10,030	11,202
Michigan	0	27	36	36	0	36	36	268	268	0	268
Minnesota	138	1,681	2,106	2,244	405	1,839	2,244	1,093	634	459	1,093
Montana	88	0	20	108	50	58	108	120	118	2	120
Nebraska	38	43	317	355	18	337	355	63	22	41	63
North Dakota	298	0	216	514	24	490	514	1	0	1	1
Ohio	1,240	1,457	3,201	4,441	2,210	2,231	4,441	110,112	41,924	68,188	110,112
South Dakota	1	0	8	9	2	7	9	69	69	0	69
Wisconsin	134	2,054	3,548	3,682	362	3,446	3,808	102,257	69,328	82,929	152,257
Wyoming	190	0	6	196	170	5	175	1	1	0	1
Total	2,920	8,298	14,116	17,036	4,645	12,496	17,141	365,734	143,067	272,667	415,734

RESURVEY, PROPERTIES, 1918 - 1925

Table 11.

Data showing, by States, the number of properties upon which sprouting bushes and seedlings were found and destroyed on resurvey in the barberry eradication campaign from April 1, 1918, to December 31, 1925

State	Number of properties on which sprouting bushes were found			Total number of properties cleared of sprouting bushes				Number of properties on which seedlings were -			
		In country							Destroyed		
	In cities and towns	having escaped bushes	Total	Total in cities and country	Dug	Treated	Total	Found	Dug	Treated	Total
Colorado	1,431	105	177	1,608	1,412	195	1,607	92	18	74	92
Illinois	404	309	652	1,056	491	565	1,056	296	236	60	296
Indiana	162	115	220	382	267	111	378	39	11	28	39
Iowa	318	286	888	1,206	659	547	1,206	212	115	97	212
Michigan	130	112	287	423	367	56	423	189	185	4	189
Minnesota	707	540	1,158	1,865	1,575	290	1,865	2,191	2,084	107	2,191
Montana	117	3	52	169	156	13	169	14	12	2	14
Nebraska	197	19	365	562	338	222	560	30	12	18	30
North Dakota	247	0	179	426	223	203	426	1	0	1	1
Ohio	1,421	281	1,021	2,442	2,104	338	2,442	716	551	165	716
South Dakota	340	33	331	671	512	159	671	74	32	42	74
Wisconsin	894	638	912	1,806	1,322	480	1,802	252	157	95	252
Wyoming	32	0	10	42	31	7	38	7	7	0	7
Total	6,406	2,441	6,252	12,658	9,457	3,186	12,643	4,113	3,420	693	4,113

RESURVEY, SPROUTING BUSHES AND SEEDLINGS, 1918 - 1925

Table 12.

Data showing, by States, the number of sprouting bushes and seedlings found and destroyed on resurvey in the barberry eradication campaign from April 1, 1918, to December 31, 1925

State	Number of sprouting bushes found				Number of sprouting bushes destroyed			Number of seedlings			
	In cities and towns	In country		Total	Dug	Treated	Total	Found	Destroyed		
		Escaped	Total						Dug	Treated	Total
Colorado	3,796	1,980	3,086	6,882	5,141	1,740	6,881	3,456	708	2,748	3,456
Illinois	4,659	4,866	10,492	15,151	6,457	8,694	15,151	202,763	77,243	125,520	202,763
Indiana	1,495	16,708	18,090	19,585	17,499	1,781	19,280	3,490	288	3,202	3,490
Iowa	3,776	7,805	17,860	21,636	10,190	11,094	21,284	42,847	27,534	15,313	42,847
Michigan	511	1,169	2,393	2,904	2,206	698	2,904	607,429	547,344	60,085	607,429
Minnesota	13,928	16,444	35,460	49,388	40,359	9,029	49,388	26,032	3,023	23,009	26,032
Montana	3,542	3	1,629	5,171	5,051	120	5,171	1,009	362	647	1,009
Nebraska	6,010	125	9,836	15,846	12,404	3,439	15,843	2,693	976	1,717	2,693
North Dakota	634	0	1,050	1,684	196	1,488	1,684	1	0	1	1
Ohio	5,666	8,046	12,276	17,942	13,071	4,871	17,942	362,585	111,527	251,058	362,585
South Dakota	20,979	5,282	22,010	42,989	36,617	6,372	42,989	9,065	6,462	2,603	9,065
Wisconsin	11,164	74,836	79,738	90,902	19,369	71,352	90,721	1,289,527	130,290	1,159,237	1,289,527
Wyoming	546	0	29	575	475	21	496	53	53	0	53
Total	76,706	137,264	213,949	290,655	169,035	120,699	289,734	2,550,950	905,810	1,645,140	2,550,950

CHEMICAL TREATMENT, 1925

Table 13.

Data showing, by States, the number of properties on which barberry bushes and sprouting barberry bushes were treated with chemicals, and the number of bushes, sprouting bushes and seedlings treated from January 1 to December 31, 1925

State	Number treated											
	With Salt			With Sodium Arsenite			With Kerosene			Total		
	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings
Colorado	24	144	953	0	0	0	3	49	0	27	193	953
Illinois	380	43,982	114,075	0	0	0	0	0	0	380	43,982	114,075
Indiana	109	1,394	1,619	0	0	0	0	0	0	109	1,394	1,619
Iowa	251	4,264	12,723	0	0	0	2	9	0	253	4,273	12,728
Michigan	258	12,248	4,822	0	0	0	6	1,282	10	264	13,530	4,832
Minnesota	154	3,197	2,332	0	0	0	0	0	0	154	3,197	2,332
Montana	15	497	1,097	0	0	0	0	0	0	15	497	1,097
Nebraska	36	388	1	0	0	0	52	943	549	88	1,331	550
North Dakota	86	685	1	0	0	0	0	0	0	86	685	1
Ohio	784	23,960	173,973	0	0	0	100	3,161	31,160	884	27,121	205,138
South Dakota	67	314	0	0	0	0	1	3	0	68	317	0
Wisconsin	368	27,830	84,309	0	0	0	0	0	0	368	27,830	84,309
Wyoming	4	38	0	0	0	0	0	0	0	4	38	0
Total	2,536	118,941	395,915	0	0	0	164	5,447	31,719	2,700	124,388	427,634

CHEMICAL TREATMENT, 1918 - 1925

Table 14.

Data showing, by States, the number of properties on which barberry bushes and sprouting barberry bushes were treated with chemicals; and the number of bushes, sprouting bushes and seedlings treated from April 1, 1918, to December 31, 1925

State	Number treated											
	With Salt			With Sodium Arsenite			With Kerosene			Total		
	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings	Properties	Bushes	Seedlings
Colorado	255	2,212	2,748	0	0	0	3	49	0	258	2,261	2,748
Illinois	1,927	154,745	1,643,402	34	839	0	5	1,169	0	1,966	156,753	1,643,402
Indiana	552	99,473	10,841	0	0	0	0	0	0	552	99,473	10,841
Iowa	1,240	31,175	20,292	0	0	0	19	280	3	1,259	31,455	20,295
Michigan	536	21,852	7,822	239	8,694	29,911	137	62,187	97,638	912	92,633	135,371
Minnesota	533	14,297	25,475	25	85	102	2	25	30	560	14,407	25,607
Montana	48	1,198	2,387	0	0	0	0	0	0	48	1,198	2,387
Nebraska	389	6,938	7,443	0	0	0	93	1,282	603	482	8,220	8,046
North Dakota	283	4,200	7	21	67	0	0	0	0	304	4,267	7
Ohio	1,038	33,351	266,923	10	1,069	59,300	259	11,016	82,110	1,307	45,436	408,333
South Dakota	456	17,159	3,266	0	0	0	8	13	16	464	17,172	3,282
Wisconsin	1,099	108,468	1,175,376	350	5,824	1,702	1*	1	0	1,450	114,293	1,177,078
Wyoming	9	56	0	0	0	0	0	0	0	9	56	0
Total	8,365	495,124	3,165,982	679	16,478	91,015	527	76,022	180,400	9,571	587,624	3,437,397

*carbon bisulphate

Table 15.

Data showing, by States, the quantities of chemicals used in the barberry eradication campaign, January 1 to December 31, 1925

State	SALT (Tons)					SODIUM ARSENITE (Gallons)			KEROSENE (gallons)		
	Furnished by					Furnished by			Furnished by		
	Property Owner	State Agency	Conference P.G. Rust	U.S.D.A.	Total	Conference P.G. Rust	U.S.D.A.	Total	Owner	U.S.D.A.	Total
Colorado	0	0	0	.330	.330	0	0	0	0	31	31
Illinois	0	4.220	0	41.271	45.491	0	0	0	0	0	0
Indiana	0	0	0	2.717	2.717	0	0	0	0	0	0
Iowa	5.763	0	.250	16.480	22.493	0	0	0	18	0	18
Michigan	0	0	0	60.117	60.117	0	0	0	0	530	530
Minnesota	1.781	.010	0	7.146	8.937	0	0	0	0	0	0
Montana	0	0	0	.472	.472	0	0	0	0	0	0
Nebraska	.110	0	0	1.230	1.340	0	0	0	150	995	1,145
North Dakota	2.970	0	0	.380	3.350	0	0	0	0	0	0
Ohio	2.229	109.027	0	3.420	114.676	0	0	0	3,004(a)	295	3,299
South Dakota	.269	0	0	2.646	2.915	0	0	0	0	7	7
Wisconsin	.03	63.800	0	.250	64.080	0	0	0	0	0	0
Wyoming	.052	0	0	.060	.112	0	0	0	0	0	0
Total	13.204	177.057	.250	136.519	327.030	0	0	0	3,172	1,858	5,030

(a) 2,934 gallons furnished by State

CHEMICALS, QUANTITIES USED, 1918 - 1925

Table 16.

Data showing, by States, the quantities of chemicals used in the barberry eradication campaign April 1, 1918, to December 31, 1925

State	SALT (Tons)					SODIUM ARSENITE (Gallons)			KEROSENE (Gallons)		
	Furnished by					Furnished by			Furnished by		
	Property owner	State Agency	Conference P. G. Rust	U.S.D.A.	Total	Conference P. G. Rust	U.S.D.A.	Total	Owner	U.S.D.A.	Total
Colorado	0:	0:	0:	3.970:	3.970:	0:	0:	0:	0:	31:	31
Illinois	.750:	54.870:	31.000:	267.271:	353.891:	0:	77.00:	77.00:	0:	124:	124
Indiana	.819:	0:	0:	56.049:	56.868:	0:	0:	0:	0:	0:	0
Iowa	44.046:	0:	20.148:	57.845:	122.039:	0:	0:	0:	400:	0:	400
Michigan	.030:	0:	8.491:	86.139:	94.660:	175.6:	129.30:	304.90:	0:	11,341:	11,341
Minnesota	2.123:	.843:	9.211:	28.972:	41.154:	0:	23.25:	23.25:	0:	0[a]	0[1]
Montana	.125:	0:	0:	4.230:	4.355:	0:	0:	0:	0:	0:	0
Nebraska	.128:	0:	8.550:	16.292:	24.970:	0:	0:	0:	150:	1,441:	1,591
North Dakota	12.130:	5.000:	0:	4.680:	21.810:	0:	7.00:	7.00:	0:	0:	0
Ohio	2.897:	135.403:	0:	8.548:	146.848:	16.2:	30.10:	46.30:	250:	6,282[b]	6,532
South Dakota	14.114:	0:	17.850:	4.796:	36.760:	0:	0:	0:	0:	22:	22
Wisconsin	.250:	120.450:	70.000:	25.200:	215.900:	408.0:	190.00:	598.00:	0:	0:	0
Wyoming	.052:	0:	0:	.160:	.212:	0:	0:	0:	0:	0:	0
Total	77,469:	316.566:	165.250:	564.152:	1,123.437:	599.8:	456.65:	1,056.45:	800:	19,241:	20,041

a - 10 gallons drip oil

b - 4,903 gallons furnished by State

GRAND SUMMARY, ORIGINAL BUSHES, SPROUTING BUSHES, AND SEEDLINGS, 1918 - 1925

Table 17.

Data showing, by States, the number of bushes, sprouting bushes and seedlings found and destroyed in all surveys in the barberry eradication campaign, April 1, 1918, to December 31, 1925

State	Original bushes		Sprouting bushes		Seedlings	
	Found	Destroyed	Found	Destroyed	Found	Destroyed
Colorado	24,434	24,429	6,882	6,881	3,456	3,456
Illinois	328,956	328,956	15,151	15,151	1,741,538	1,741,538
Indiana	196,395	195,506	19,585	19,280	12,106	12,106
Iowa	793,847	793,841	21,636	21,284	49,564	49,564
Michigan	481,700	458,783	2,904	2,904	1,544,273	1,544,273
Minnesota	785,956	785,956	49,388	49,388	48,336	48,336
Montana	11,293	11,100	5,171	5,171	4,771	4,771
Nebraska	95,516	95,452	15,846	15,843	11,873	11,872
North Dakota	22,414	22,414	1,684	1,684	157	157
Ohio	292,142	286,729	17,942	17,942	530,836	529,646
South Dakota	59,811	59,811	42,989	42,989	26,608	26,608
Wisconsin	3,404,253	2,896,030	90,902	90,721	1,335,367	1,331,081
Wyoming	4,176	4,007	575	496	53	53
Total	6,500,893	5,963,014	290,655	289,734	5,308,938	5,303,461

Total found 12,100,486
Total destroyed 11,556,209